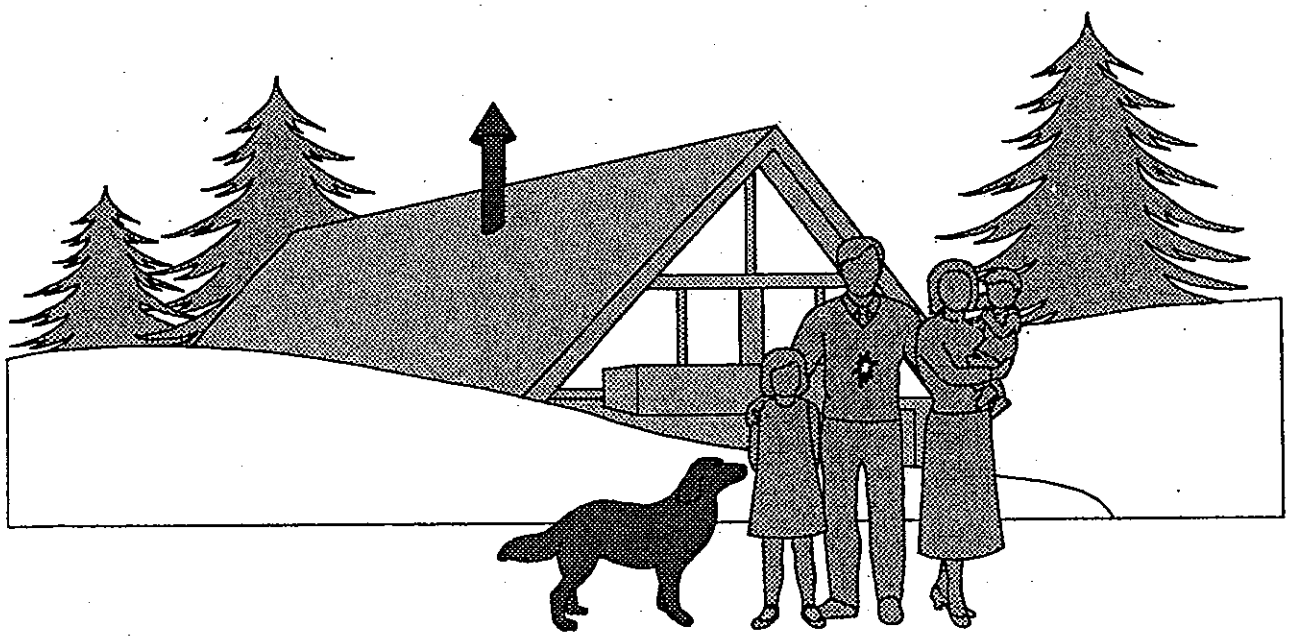
INDIVIDUAL SEWAGE DISPOSAL DESIGN HANDBOOK FOR MONROE COUNTY, NEW YORK



This Design Manual was developed by staff of the Monroe County Health Department's Division of Environmental Health - Bureau of Public Health Engineering.

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INTRODUCTION

These Standards apply to on-site wastewater treatment systems in Monroe County serving newly constructed residential properties and receiving sewage without the admixture of industrial or other wastes, as defined in Environmental Conservation Law Section 17-0701, in quantities of less than 1,000 gallons per day (gpd). The standards also apply to replacement systems (repairs) whenever possible.

Standards which meet or exceed the criteria presented in Part 75-A of Title 10 the Official Compilation of Codes, Rules and Regulations of the State of New York are allowed pursuant to Section 75-A.2(b).

I. **Definitions** - As used in this document, the following words and terms shall have the indicated meaning:

Absorption Area - an area to which wastewater is distributed for infiltration into the soil. For the purposes of sewage treatment in Monroe County and to maximize the effective lifespan of the treatment system, the absorption area shall be located so that routine maintenance is ensured. The absorption area shall also be kept free of trees and other shrubbery that may compromise effective operation.

Absorption Field - a network of pipes by which wastewater is distributed for infiltration into the soil.

Aerobic Treatment Unit - a system that provides for biological decomposition of the organic portion of the wastewater by mechanical aeration.

Aggregate - in general and unless otherwise specified, washed gravel or crushed stone 3/4" to 1-1/2" in size.

Application Rate - for design purposes, the rate at which septic tank effluent is applied to a subsurface absorption area. The application rate is expressed in gallons per day per square foot (gpd/sq. ft.).

Baffle - a flow deflecting device used in septic tanks and distribution boxes to inhibit the discharge of floating solids, grease and oil and reduce the amount of settleable solids that exits the tank.

Barrier Material - a permeable geotextile, untreated building paper or a four-inch thick layer of hay or straw.

Building Sewer - that part of the drainage system which extends from the end of the building drain and conveys wastewater to the sewage system or sewer.

Cleanout - an opening providing access to part of the sewage system.

Curtain Drain - a subsurface drain designed and constructed to control groundwater and surface water intrusion into the absorption area.

Design Professional - a person licensed or registered in the State of New York as an Engineer, Architect and/or Land Surveyor and authorized by the State Education Law to design the systems described in the standards.

Director - The Monroe County Director of Health or a designated representative.

Distribution Device - a device used to distribute sewage to distribution lines.

Distribution Line - the perforated pipe used to distribute wastewater to the absorption area.

Drinking Water - water whose physical, chemical and biological quality is or is intended to be satisfactory for human consumption, food preparation and/or culinary purposes.

Effective Grain Size - a measure of the diameter of soil particles, when compared to a theoretical material having an equal transmission constant. It is the dimensions of that mesh screen which will permit ten percent of the sample to pass while retaining 90 percent.

Expansion Area - an area designated for system replacement and/or expansion. This area shall be equal to at least fifty percent (50%) of the original absorption area.

Gas Baffle - a device on the outlet of a septic tank which deflects gas bubbles away from the outlet and reduces the carry over of solid particles from the septic tank.

Groundwater - subsurface water, including seasonally high groundwater, occupying the saturation zone from which wells and springs are fed.

Heavy Equipment - all equipment which would result in the compaction of the absorption area at a depth equivalent to the design depth of the distribution lines.

Impermeable layer - any layer of soil which will not allow the infiltration of water or septic tank effluent. Impermeability is quantitatively defined as a percolation rate in excess of 60 min./in. or qualitatively determined by inspection of a deep test pit.

Infiltration - the flow or movement of water into the interstices or pores of a soil through the soil interface.

Invert - the floor, bottom or lowest point of the inside cross section of a pipe, manhole, distribution box or other similar appurtenance.

Percolation - the movement of water through the pores of a soil or other medium following infiltration through the soil interface.

Permeability - a measure of the rate of movement of liquid through soil. Permeability is expressed in gallons per day per square foot (gpd/sq.ft.).

Scum - the wastewater material which is less dense than water and floats on top of the water.

Sewage - the combination of human and household waste with water which is discharged to the home plumbing system - includes the waste from a flush toilet, bath, sink, lavatory, dish washing or laundry machine or the water-carried waste from any other fixture, equipment or machine.

Stabilized Rate of Percolation - the rate corresponding to two consecutive equal or near equal (within 10 percent) percolation test results after the initial run.

Useable Soil - unless otherwise stated, a soil with a percolation rate of between 1 min./in. and 60 min./in. with a compatible soil classification.

Wastewater - any water, produced in the house or property, which is discharged from a house through a plumbing fixture. Wastewater includes, but is not limited to, sewage and water or waste (e.g., water softener brine) from a device.

Watercourse - a NYSDEC classified stream.

Watershed - an area of drainage for a body of water that serves as a source of drinking water and for which watershed rules and regulations have been adopted by the State Commissioner of Health.

Well head area - the area surrounding a well, including the cone of influence (where the drawdown of groundwater causes groundwater flow).

Wetland - an area of marshes or swamps which has been designated as such by the State Department of Environmental Conservation or other agency having jurisdiction. A marsh or swamp that has not been classified by an agency as a wetland shall not be treated for design purposes as a wetland.

II. **Regulation by Other Agencies** - Where sewage treatment systems are to be located on the watershed(s) or well head area(s) of public water supplies, the rules and regulations enacted by the State Department of Health for the protection of these supplies must be observed.

This regulation establishes the minimum standards acceptable in Monroe County.

When individual sewage systems overlay a drinking water aquifer, this Department may establish population density limits and minimum lot sizes for residential development with on-site sewage treatment systems.

III. **Sewage Flows** - Roof, footing, garage, cellar and surface water drainage must be excluded from the system. Water softener, water recharge and backwash wastes are not to be discharged to the system unless a separate subsurface discharge to an area 250 feet from wells or water courses is unavailable.

Minimum design flows for various configurations of plumbing fixtures shall be as shown in Table 1.

IV. **Soil and Site Appraisal**

A. Site Investigation - Areas lower than the ten-year flood level are unacceptable for on-site systems. Slopes greater than 15 percent are also unacceptable.

There must be at least two feet of useable soil available between the bottom of the absorption area and

rock, unsuitable soil or high seasonal groundwater for the installation of a standard absorption trench system (Section VIII-A). Where private wells are used for water supply, four feet of useable soil must be available between the bottom of the absorption area and rock. Soils with a rapid percolation rate (< 1 min./in.) are not suitable for conventional subsurface treatment systems.

Subsurface treatment systems, including all components of such sewage systems, shall be separated from building, property lines, utilities and wells to maintain system performance, permit repairs and reduce undesirable effects of underground sewage flow and dispersion. The minimum separation distances from various components of treatment systems are provided in Table 2. Reduced separation distances may be approved upon request when the site evaluation by a design professional or soil scientist clearly establishes that there will be no adverse environmental impact and separation will not interfere with the satisfactory operation and maintenance of the system.

Once the required infiltration area is determined based on anticipated daily flow, percolation tests and soil evaluation, the required useable area of the property for subsurface treatment can be identified. An additional useable area of 50 percent shall be set aside for future expansion or replacement.

B. Soil Investigation - Groundwater characteristics shall be determined and shall include the depth to the seasonal high groundwater level and the type of water table - perched, apparent or artesian.

If a subsurface treatment unit is planned, at least four feet of useable soil shall be available over impermeable deposits (i.e., clay or bedrock). The bottom of the proposed absorption area shall be at least two feet above the highest groundwater level. Where systems are to be installed above drinking water aquifers, a separation of four feet to bedrock is required. At least one test hole a minimum of six feet deep shall be dug within the proposed absorption area to insure that uniform soil and site conditions prevail.

If observations reveal differing soil profiles, additional holes shall be dug and tested. These additional holes shall be spaced to indicate whether there is a sufficient area of useable soil to install the system. In most cases, treatment systems shall be designed to reflect the most severe conditions

encountered. The exception occurs when the highest perc rate conflicts with the other perc test results and the lower results are consistent with the deep hole evaluation.

If the percolation tests results are inconsistent with field determined soil conditions, additional percolation tests must be conducted. The most restrictive tests shall be used for system design unless permission for the use of the less-restrictive tests is formally granted by the Monroe County Health Department.

Test holes for seepage pits shall extend to at least mid-depth and full depth of the proposed pit bottom. At least three feet of useable soil shall exist between the pit bottom and rock or other impermeable soil layer and the highest groundwater level. This shall be confirmed by extending at least one deep test hole three feet below the deepest proposed pit.

C. Soil Percolation Test (Figure 1) - Once preliminary investigation is completed, the design professional will be required to stake out the area that is chosen for the absorption area. It will then be the responsibility of the design professional to make available for testing three percolation holes throughout the proposed absorption area, presoak each hole and prepare for Health Department staff to witness three percolation tests as well as complete a deep hole investigation. Each perc hole shall be deep enough to reach the bottom of trenches in the absorption area. Preliminary holes can be used for formal testing at the discretion of the design professional.

It is important to realize that the method of presoaking is dependent upon the type of soil encountered and the time of year during which the percolation tests are being run. Completely filling the perc holes with water the day before the percolation test may be sufficient in many cases. Testing that is performed during a dry spell may document unrealistically rapid percolation rates. Prudent testing might involve repeated filling of the percolation hole(s) over a period of several days. The need to so modify the test method will be determined by the designer and subject to review by our field staff.

The perc test shall consist of filling the hole with water to a depth of six inches and observing the time required for the water to drop one inch (from six to five inches). The test shall be repeated until the time for the one-inch drop for two successive tests

gives approximately equal results (defined as within 10% of each other). The last test result will then be taken to represent the stabilized rate of percolation and be the basis for design of the leach or absorption area required for the subsurface sewage disposal system.

The use of additives in the water or soil is strictly prohibited. The replacement of soil with a more permeable material or mechanical loosening of soil for the purpose of enhancing the percolation rate is similarly prohibited.

The stakes that were placed to locate the absorption area are to be left in place so that the area can be reserved for system installation. In addition, each area is to be provided with a permanent marker (filling one of the percolation holes with concrete to grade would be one acceptable method of establishing horizontal and vertical control) for future identification. Plans submitted to this Office for review shall provide a detailed description of the method chosen to provide said control. Any change in the location of the system or alteration of existing grade by cutting or filling before system installation will require notification of this Office prior to start of construction. Staff will then be in a position to determine subsequent action, including additional testing and/or system redesign.

On multiple lot subdivisions where, due to manpower constraints, Health Department staff are not able to witness percolation tests on all lots, the procedure for preparing for our presence will remain as noted above. The location of the area reserved for leach field installation for each lot will be appropriately staked out. Health Department staff will then choose the lots where we will witness percolation tests. All other percolation tests conducted by the design professional will be certified to the Department as accurate in terms of test procedure and data generated.

For seepage pits, one test shall be conducted at the bottom depth and the other at half the pit depth. If different soil layers are encountered when digging the test pit, a percolation test shall be performed in each layer with the design percolation rate being the highest test result.

A percolation test is only an indicator of soil permeability and must be consistent with the soil classification of the site as determined from the test holes.

V. **House Sewer** - House sewers are laid on firm foundation at a minimum grade of one-quarter inch per foot preferably without bends. At least one cleanout with a properly fitted plug is to be provided. The house sewer shall allow for venting of gases from the sewage system.

House sewer construction, including materials, shall comply with the applicable requirements of the State Uniform Fire Prevention and Building Code contained in 9NYCRR, Parts 903 through 907 inclusive, and Part 1250.

A minimum horizontal separation of ten feet should exist between the house sewer and any water line. Where lines must cross, the water service line shall be at least 12 inches above the house sewer. If a water line must pass below the house sewer, the vertical separation must be at least 18 inches.

Suction waterlines shall never cross under house sewers or any other component of the sewage system.

VI. **Septic Tanks** (Figure 2)

A. General Information - The required septic tank capacity shall be based upon the number of household bedrooms. An expansion attic shall be considered as an additional bedroom. Table 4 specifies minimum septic tank capacities and minimum liquid surface areas.

Septic tank covers shall always be accessible. Where manholes are more than 12 inches below final grade, an extension collar shall be provided over each opening. Extension collars shall not be brought flush with the ground surface unless the cover can be locked to prevent tampering. Driveways or other facilities shall not be constructed above a septic tank unless the tank is specially designed and reinforced to safely carry the load imposed.

B. Design and Installation (these requirements shall apply to all tanks regardless of material) - a minimum liquid depth of 30 inches shall be available. The maximum depth for determining the allowable design volume of a tank shall be 60 inches. Deeper tanks provide extra sludge storage, but no credit will be given toward design volume.

The minimum distance between the inlet and outlet shall be six feet. All tanks shall meet the minimum liquid surface area requirement for the design volume specified in Table 4. The effective length (distance between the inlet baffle and the outlet baffle) of

rectangular tanks should not be less than two nor more than four times the effective width (width of the inside of the tank).

Tanks must be watertight and constructed of durable material not subject to corrosion, decay, frost damage or cracking. The tank shall be filled to normal operating liquid level and visually checked for leakage before backfilling. After installation, all septic tanks shall be able to support a dead load of at least 300 pounds per square foot (psf).

Tanks with a liquid depth of 48 inches or more shall have a top opening with a minimum of 20 inches in the shortest dimension to allow entry into the tank. Tanks with a liquid depth less than 48 inches shall have a top opening that is at least 12 inches in the shortest dimension.

Tanks shall have inlet and outlet baffles, sanitary tees or other devices to prevent the passage of floating solids and to minimize disturbance of settled sludge and floating scum by sewage entering and leaving the tank. Gas deflection baffles are required in all tank outlets (Figure 3). Inlet and outlet baffles shall extend a minimum of 12 inches and 14 inches, respectively, below the liquid level in tanks with a liquid depth of less than 40 inches, and 16 and 18 inches, respectively, in tanks with a liquid depth of 40 inches or greater. The distance between the outlet baffle and the outlet shall not exceed six inches. Baffles shall be constructed of a durable material not subject to corrosion, decay or cracking.

There shall be a minimum clearance of one inch between the underside of the top of the tank and the top of all baffles, partitions and/or tees to permit venting of tank gases.

Tanks shall be placed on a sand or pea gravel bed at least three inches thick. This will provide for proper leveling and bearing. Additional instructions provided by the manufacturer shall also be followed.

There shall be a minimum drop in elevation of two inches between the inverts of the inlet and outlet pipes.

Multi-compartment tanks or tanks in series are required. Dual compartments are recommended for all tanks and shall be required on all tanks with an interior length of ten feet or greater.

The first compartment or tank (inlet side) shall account for 60-75 percent of the required total design volume.

The baffle separating the compartments shall extend from the bottom of the tank to at least six inches above the invert of the outlet pipe.

Compartments shall be connected by a four-inch vertical slot at least 18 inches in width, a six-inch elbow or two four-inch elbows located at a distance below the liquid level equal to one-third the distance between the invert of the outlet and the bottom of the tank. At least one access manhole shall be provided into each compartment.

Tanks in series should be connected by a single pipe with a minimum diameter of four inches.

The total volumes and surface areas of all individual tanks and/or chambers shall be equal to or greater than the volume and surface area requirements listed in Table 4.

C. Concrete Tanks - Concrete shall have a minimum 28-day compressive strength of 2,500 pounds per square inch (psi); 3,000 psi concrete is recommended.

Wall thickness shall be a minimum of three inches unless the design has been certified by a New York licensed professional engineer as complying with all appropriate requirements for thin-wall construction. All walls, bottom and top shall contain reinforcing to insure ability to support a dead load of 300 psf.

All joints shall be sealed so that the tank is watertight; joints below the liquid level must be tested for watertightness prior to backfilling. The tank shall be filled to normal operating liquid level and visually checked for leakage before backfilling.

The walls and floor of cast-in-place tanks shall be poured at the same time (monolithic pour).

D. Fiberglass and Polyethylene Tanks - These tanks shall not be installed in areas where the groundwater level can rise to the level of the bottom of the septic tank unless the tank is anchored.

Particular care must be taken during installation, bedding and backfilling of these units so as to prevent damage to tank walls. The manufacturer's installation instructions shall be followed.

All tanks should be sold completely assembled by the manufacturer. If, because of size, the tank is delivered to the site in sections, all joints shall be sealed with watertight gaskets and shall be tested for watertightness after installation and prior to backfilling. The tank shall be filled to normal operating liquid level and visually checked for leakage before backfilling.

E. Steel Tanks - Steel tanks are prohibited.

F. Aerobic Units - A homeowner may choose to install an aerobic unit instead of a septic tank under the following conditions:

The unit shall have a label indicating compliance with the standards for a Class I unit as described in the National Sanitation Foundation (NSF) Standard 40 or equivalent.

The rated capacity of the unit shall be equal to or greater than the design flow as determined using the factors listed in Table 1.

The absorption system that follows the unit shall be sized in the exact same manner as it would for a septic tank.

Units which do not include as a standard feature a service contract which provides for, as a minimum, semiannual inspections and annual pumping for three years or more are prohibited.

The surface discharge of aerobic unit effluent is strictly prohibited.

VII. Effluent Distribution

A. Distribution by Gravity - Gravity flow is the simplest and most commonly used method of effluent distribution. Wastewater is allowed to flow into the absorption field directly from the septic tank. The rate and quantity of flow are functions of the amount of water used for domestic purposes in the structure served by the on-site sewage treatment system.

1. Distribution Box (Figure 4) - The distribution box is a common watertight box from which a network of distribution laterals extends. The box may be round or rectangular with a single inlet and an outlet for each distribution lateral. Its purpose

is to divide the incoming wastewater equally among the laterals.

Distribution box networks may be used in multi-trench systems or in beds with independent distribution laterals. They are suitable for all gravity flow systems and certain systems that rely on pressurized distribution. Distribution box networks are suggested only for absorption systems located on level or gently sloping sites.

The maximum length of an individual absorption line used in conjunction with gravity distribution shall be 60 feet.

For accessibility, it is necessary that the location of the distribution box be properly documented. The box shall have a removable cover not more than 12 inches below grade. Where, due to site conditions, a distribution box must be greater than 12 inches below the surface, an extension collar shall be installed to within 12 inches of the surface.

All outlets from the distribution box shall be at the same level to insure the even distribution of flow.

To minimize frost action and reduce the possibility of movement once installed, distribution boxes must be set on a sand or pea gravel bed at least 12 inches thick.

The drop between inlet and outlet inverts shall be at least two inches. A baffle is required at the inlet side of the box when the slope from the septic tank to the box exceeds 1/2 inch per foot.

There shall be a minimum two-inch clearance between the inverts of the outlets and the bottom of the box to prevent short-circuiting and reduce solids carry-over.

Distribution boxes may be constructed in place or purchased prefabricated. Concrete used to construct boxes shall have a minimum 28-day compressive strength of 2,500 psi.

Prefabricated boxes may be constructed of concrete, fiberglass or plastic. The boxes shall be installed in conformance with the manufacturer's instructions in addition to the requirements listed above.

2. Drop Box or Drop Manhole (Figure 5) - A special type of gravity distribution, drop boxes should be used where the fall of the ground surface exceeds approximately 24 inches within the area used for the absorption field. Each adjacent trench (or pair of trenches) is connected to the next by use of a drop box and a closed pipe. Effluent is discharged to the first trench until it is filled. The arrangement of outlets in the drop box then allows effluent to overflow through the closed line to the next trench downhill. In this manner each portion of the subsurface system is used in succession or series.

   The maximum length of an individual absorption line used in conjunction with drop boxes shall be 75 feet.

   For accessibility, it is necessary that the location of each box be properly documented. The boxes shall have removable covers not more than 12 inches below grade.

   Where, due to site conditions, a box (or boxes) must be greater than 12 inches below the surface, an extension collar shall be installed to within 12 inches of the surface.

   The lateral outlet inverts are located at or near the bottom of the box.

   To minimize frost action and reduce the possibility of movement once installed, distribution boxes must be set on a bed of sand or pea gravel at least 12 inches thick.

   The inlet invert of a drop box shall be above the overflow invert.

   Drop boxes may be constructed in place or purchased prefabricated. Concrete used to construct boxes shall have a minimum 28-day compressive strength of 2,500 psi.

   Prefabricated boxes may be constructed of concrete, fiberglass or plastic. The boxes shall be installed in conformance with the manufacturer's instructions in addition to the requirements listed above.

B. Distribution by Pressure - Pressure distribution and dosing are methods which permit the rapid distribution of effluent throughout the absorption system followed

by a rest period during which no effluent enters the system.

Dosing or pressure distribution is recommended for all systems as each method promotes better treatment of wastewater and increased system longevity.

The maximum length of an individual absorption line used in conjunction with these methods shall be 100 feet.

The use of manually operated siphons or pumps is not acceptable.

Only pumps designated by the manufacturer for use as sewage effluent pumps shall be used.

Pump chambers shall be equipped with an alarm (both visual and audio) to indicate malfunction.

1. Pressurized Distribution (Figure 6) - Pressurized distribution uses small diameter pipe with perforations. The volume of water that flows out each hole must be approximately equal. This requires that 75 to 85 percent of the head loss in the network must occur when the water passes through the holes. On sloped sites, the difference in total head within each lateral must be taken into account.

   Pipe used in pressure distribution shall have a minimum diameter of 1-1/2 inches and a maximum diameter of three inches. The ends of all pipes shall be capped.

   Hole size should be between 1/4 inch and 5/8 inch in diameter; the maximum allowable hole spacing is 10 feet, but no more than 6 feet is recommended. The perforation at the end of the lateral should be drilled horizontally in the endcap near the crown of the pipe to facilitate venting. In beds with pressure distribution the lateral spacing should be approximately equal to the perforation spacing, and holes on adjacent laterals should be staggered so that they lie on the vertices of isosceles triangles.

   The application volume for pressure distribution should be 5 to 10 times the network pipe volume. The dosing chamber should have a reserve capacity above the active application volume equal to one-half day's average flow.

Pressure distribution systems shall not be equipped with an overflow.

2. Dosing - Dosing involves the use of a pump or siphon (Figure 7) to move sewage effluent into the pipe network. Discharge from the pipe is by gravity. The volume of effluent in each dose should be 75 percent to 85 percent of the volume available in the distribution pipe network. Four pumping cycles per day are considered ideal.

   Pipe used for dosing is sized to conform with the volume of the dose and can range from three to six inches in diameter based upon the volume of each dose. The ends of all pipes shall be capped.

   In absorption fields, single dosing units are used when the total trench length exceeds 500 feet. Alternate dosing units are required when the length exceeds 1,000 feet.

   In order to avoid washout of the baffles in the distribution box, the pumped force main shall enter into a ten-foot section of gravity four-inch PVC pipe or other pressure-reducing device to minimize entry velocity.

   The distribution box must contain a baffle.

   Dosing volume applied to a drop box system must be limited to 85 percent of the volume of the first distribution pipe.

   Siphon dosing systems normally include an overflow to the distribution laterals.

VIII. Conventional Subsurface Treatment Systems - All effluent from septic tanks or aerobic tanks shall be discharged to a subsurface treatment system. Surface discharge of septic tank or aerobic unit effluent will not be approved by the Monroe County Department of Health for new residential properties.

A. Standard Absorption Trench Systems (Figure 9) - Standard absorption trench systems are used where the upper soil horizons are more permeable than the deeper subsoil. Plant activity helps reduce loading on the system during the growing season by the transpiration of measurable amounts of liquid and removal of some nitrogen and phosphorous from the wastewater. Construction delays due to wet soils are also reduced since the upper horizons dry more quickly.

1. Site requirements - The minimum horizontal separation distances between absorption fields and other facilities are shown on Figure 8 and in Table 2.

   A minimum of four feet of useable soil shall exist above bedrock and ground water with a minimum separation of two feet to the lowest part of any trench. Where private wells are used for water supply, at least four feet of useable soil is needed between the bottom of the lowest trench and bedrock.

   Absorption fields shall not be built in areas intended for driveways, portions of buildings, above-ground swimming pools or other areas subject to heavy load. Surface waters shall be diverted from the vicinity of the system.

2. Design criteria - The required length of absorption trench is determined from Table 5 based upon the percolation test results and confirmed by the soil evaluation. The maximum trench width for design purposes shall be 24 inches. Only 24 inches shall be allowed for absorption area calculations. Where trenches exceed 24 inches in width, calculations of absorption area shall be based on a width of 24 inches.

   Adjacent trenches shall be separated by at least six feet of undisturbed soil. Individual trenches shall be constructed parallel to the ground contours with trench bottoms as near level as possible. They need not be perfectly straight but abrupt changes in direction shall be avoided.

3. Materials - Solid (non-perforated) pipe shall be used between the distribution box and the trenches. Perforated distributor pipe shall be used in the trenches. Pipe shall be made of rigid plastic and be labelled as fully meeting ASTM standards for use in septic systems. Corrugated plastic pipe shall not be used.

   Aggregate shall mean washed gravel or crushed stone 3/4" to 1-1/2" in diameter. Larger diameter materials or finer substances and run-of-bank gravel are unacceptable.

   The aggregate shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and

treated building paper are relatively impervious and shall not be used.

4. Construction - Trench locations and depths should be marked by stakes before the trenches are excavated. The natural surface shall not be significantly disturbed. Heavy equipment shall be kept away from the field because its weight may permanently alter soil characteristics due to compaction, cause trench cave-ins and/or misalign and break pipe. Swales shall be constructed to divert surface water around the system. This work shall be completed prior to the installation of absorption trenches.

   The trench depth shall be as shallow as possible but not less than 18 inches. Trenches shall be excavated to design depth with bottoms practically level.

   Trenches which encounter groundwater are not acceptable. If groundwater is encountered the installation must cease immediately. The Health Department is to be notified of the situation. Installation shall not be resumed until an acceptable revised plan is approved by the Monroe County Department of Health.

   Trenches which contain water at the time of inspection shall be rejected. The design professional will be required to evaluate the system and report the cause(s) of such an occurrence to the Monroe County Health Department. Upon review of the report, the Department will either accept the installation or require alterations.

   Trench bottoms and any smeared surface on the trench walls are to be raked. At least six inches of aggregate is then immediately placed in the trench. Distribution lines are carefully placed on the aggregate and covered with aggregate to a depth of at least two inches over the top of the pipe. Additional aggregate may be required to bring the top of the aggregate to within six to 12 inches of the surface. After the upper aggregate is placed, the barrier material is to be immediately installed and the trench backfilled with native soil.

   Depth of earth cover over the aggregate should not exceed 12 inches in order to enhance natural aeration and nitrogen uptake by plant life. If

the trenches cannot be immediately backfilled, they should be temporarily covered with an impervious material such as treated building paper to prevent sidewall collapse and siltation into the aggregate.

The earth backfill is to be mounded slightly above the original ground level to allow for settling and, after settlement, the entire area should be graded without the use of heavy equipment and seeded with grass.

5. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

B. Deep Absorption Trench Systems (Figure 10) - Deep absorption trench systems can be used to reach more permeable soil horizons when certain boundary conditions, like the proximity of the groundwater table, do not preclude their use. Greater trench depth results in an increased ratio of sidewall area to bottom area. Deep systems also permit a greater depth of liquid ponding, increasing the hydraulic gradient across the infiltrative surface.

1. Site Requirements - Deep absorption trenches are used on sites where a useable layer of soil is overlaid by three to five feet of impermeable soil.

2. Design Criteria - There shall be at least four feet of useable soil beneath the impermeable layer.

The required length of absorption trench is determined from Table 5 based upon percolation tests conducted in the underlying soil.

3. Materials - Solid (non-perforated) pipe shall be used between the distribution box and the trenches. Perforated distributor pipe shall be used in the trenches. Pipe shall be made of rigid plastic and labelled as fully meeting ASTM standards for use in septic systems. Corrugated plastic pipe shall not be used.

Aggregate shall mean washed gravel or crushed stone 3/4" to 1-1/2" in diameter. Larger or

smaller diameter material and run-of-bank gravel are unacceptable.

The aggregate shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

4. Construction - Trench locations and depths should be marked by stakes before the trenches are excavated. The natural surface shall not be significantly disturbed. Heavy equipment shall be kept away from the field because its weight may permanently alter soil characteristics due to compaction, cause trench cave-ins and/or misalign and break pipe. Swales shall be constructed to divert surface water around the system. This work shall be completed prior to the installation of absorption trenches.

Trenches are excavated at least two feet into the useable layer. Trenches shall be excavated to design depth with bottoms practically level.

Trenches which encounter groundwater are not acceptable. If groundwater is encountered the installation must cease <u>immediately</u>. The Health Department is to be notified of the situation. Installation shall not be resumed until an acceptable revised plan is approved by the Monroe County Department of Health.

Trenches which contain water at the time of inspection shall be rejected. The design professional will be required to evaluate the system and report the cause(s) of said occurrence to the Monroe County Health Department. Upon review of the report, the Department will either accept the installation or require alterations.

Trench bottoms and any smeared surface on the trench walls are to be raked. Aggregate is placed in the trench to within 18 inches of the ground surface. Distribution lines are carefully placed on the aggregate and covered with aggregate to a depth of at least two inches over the top of the pipe. Additional aggregate may be required to bring the top of the aggregate to within six to 12 inches of the surface. After the upper aggregate is placed, the barrier material is to be

immediately installed and the trench backfilled with native soil.

Depth of earth cover over the aggregate should not exceed 12 inches in order to enhance natural aeration and nitrogen uptake by plant life. If the trenches cannot be immediately backfilled, they should be temporarily covered with an impervious material such as treated building paper to prevent sidewall collapse and siltation into the aggregate.

The earth backfill is to be mounded slightly above the original ground level to allow for settling and, after settlement, the entire area should be graded without the use of heavy equipment and seeded with grass.

5. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

C. Cut and Fill Systems - A cut and fill system is an absorption system installed on sites where impermeable soil overlays a permeable soil or where soils are so rapidly permeable that insufficient treatment will occur before the wastewater reaches bedrock or ground water.

1. Impermeable Soil Systems (Figure 11)

a. Site requirements - where soil with a percolation rate slower than 45 min./in. overlays a usable soil with a percolation rate between 1 and 45 min./in. but inadequate separation to bedrock or ground water precludes the use of deep absorption trenches.

At least three feet of usable soil is available beneath the tight soil.

All minimum horizontal and vertical separations as described in Tables 2 and 3 respectively can be maintained.

b. Design criteria - The design shall provide for the removal of the unusable soil and

replacement with sand fill material approved by the Monroe County Department of Health.

A standard absorption trench system is designed as described in Section VIII A.2, with the exception that the required length of absorption trench is based upon the percolation rate of the underlying soil. For soils faster than 15 min./in., a minimum design rate of 15 min./in. shall be used.

c. Construction - The area excavated and filled must provide a five-foot buffer in each direction beyond the trenches.

The surface area of the system must be mounded and graded to enhance runoff of rainwater from the system and seeded to grass.

d. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

2. Rapidly Permeable Soil Systems (Figure 12)

a. Site requirements - For soil with a percolation rate faster than 1 min./in.

All minimum horizontal and vertical separations as described on Tables 2 and 3 respectively can be maintained.

b. Design criteria - The design shall provide for the removal of four feet of unusable soil and replacement with three feet of sand fill material approved by the Monroe County Department of Health.

The required length of absorption trench is based upon the percolation rate of the fill material. For fill material faster than 15 min./in., a minimum design rate of 15 min./in. shall be used.

An absorption trench system is designed as described in Section VIII A.2. except as noted above.

c. Construction - The area excavated and filled must provide a five-foot buffer in each direction beyond the trenches.

The surface area of the fill system must be mounded and graded to enhance runoff of rainwater from the system and seeded to grass.

d. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

3. Sand Fill Quality - Fill shall consist of clean uniform medium to coarse sand which passes the test described below:

The standard testing device is a plastic 500 ml. graduated cylinder with eight 1/8-inch diameter holes drilled through the bottom.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed in the bottom of the cylinder.

Water is added to the sand sample to a point where the sand is wet but not saturated. The sample is then mixed.

The sample is compacted in three lifts of approximately three inches each. Compaction is achieved by ramming each lift with a wooden dowel or other similar instrument. The dowel is of a slightly smaller diameter than the cylinder.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed over the compacted sand.

The cylinder is supported upright over a basin or can to catch the test water. The cylinder bottom is not to become immersed in water.

Water is poured into the cylinder and allowed to percolate through the sand until saturation is obtained.

Approximately two inches of water is added above the gravel and the time for that water to drop one inch is recorded.

The sand fill is regarded as acceptable if the stabilized rate for one-inch drop in the test cylinder is greater than one min./in. and less than 15 min./in. All fill shall pass the 1/4-inch sieve.

D. Absorption Bed Systems (Figure 13) - An absorption bed system operates on a principle similar to the absorption trench except that several laterals, rather than just one, are installed in a single excavation. This reduces the effective sidewall infiltration area per linear foot of lateral or distribution line.

1. Site Requirements - A bed system may be built in soils with a percolation rate between one and 30 minutes per inch. A bed shall not be built where the soil evaluation indicates silt loam, clay loam or clay.

   Elevation change of the site shall not exceed one foot over the width of the bed.

   The longer dimension of the bed shall be parallel to the contours.

   All minimum horizontal and vertical separations as described in Tables 2 and 3 respectively can be maintained.

2. Design Criteria - Pressure distribution or dosing is required for the installation of an absorption bed system.

   The maximum width of the bed shall be 20 feet. The maximum length of each lateral from a pressure manifold shall be 100 feet. A bed utilizing a center manifold system may then have a maximum length of 200 feet.

   The bottom of the bed shall be between 18 and 30 inches below original ground level.

   Laterals shall be spaced five feet on centers. Two and one-half feet (2-1/2') must be provided between the laterals and the sidewalls. In the maximum width of 20 feet, only four laterals may be installed. The maximum dimensions of a bed system using pressure distribution with a center manifold shall be 205 feet by 20 feet.

The required bed bottom area shall be calculated from the application rates shown in Table 7.

3. Construction - Heavy construction equipment shall be kept outside the proposed bottom area of the bed.

   The required bed bottom area is excavated as level as practical. The bottom and sides of the excavation are hand raked to reduce soil smearing.

   After excavating, a six-inch layer of aggregate is placed across the bottom of the bed.

   The laterals are laid level on the aggregate and covered with aggregate to a level two inches above the top of the pipe.

   The entire bed area shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

4. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

E. Seepage Pits (Figure 14) - A seepage pit, sometimes called a leaching pit, leaching pool or (incorrectly) a cesspool, is a covered pit with an open-jointed or perforated lining through which septic tank effluent seeps into the surrounding soil.

1. Site Requirements - If soil and site conditions are adequate for absorption trenches, seepage pits shall not be used.

   Seepage pits are not to be used in conjunction with private wells.

   A minimum three-foot vertical separation must exist between the bottom of any pit and the high groundwater level, bedrock or other impervious layer.

2. Design Criteria - The required effective seepage pit absorptive area is obtained from either Table 8 or 9.

No allowance for infiltration area is made for the bottom area of a pit or the surface area of impervious soil layers (percolation rate greater than 45 minutes/inch).

The effective diameter of a pit includes the diameter of the lining plus the added diameter provided by the annular ring of aggregate.

Effective depth is measured from the invert of the seepage pit inlet to the floor of the pit, with the thickness of impervious layers deducted.

Linings may be precast concrete, cast-in-place concrete or built in place with unmortared hollow cinder or concrete blocks. Concrete shall have a minimum 28-day compressive strength of 2,500 psi; 3,000 psi is recommended. Material with comparable structural strength, determined in accordance with commonly accepted sewage construction standards, principles or practices, may be allowed on an individual basis to prevent unreasonable hardship, provided public health is not prejudiced.

The separation between the outside edges of seepage pits shall be three times the effective diameter of the largest pit. This separation is defined as the undisturbed soil between pit excavations.

Pits shall be designed with sufficient structural stability to withstand lateral soil forces as well as vertical loads.

3. Construction - Laterals leading to each seepage pit must be at least four inches in diameter with a minimum slope of 1/8" per foot.

Seepage pits shall not be connected in series. A distribution box shall be required where more than one seepage pit is installed.

The pit excavation is to be raked to minimize sidewall smearing that reduces infiltration capacity. If groundwater is encountered, the pit shall be backfilled with the original soil to a level at least three feet higher than maximum

groundwater and adjustments made in the pit dimensions.

The linings are to be placed upon a concrete block, a six-inch layer of aggregate, poured concrete or precast footing and surrounded by a six-inch minimum annular ring of large aggregate (2-1/2" to 4" in size).

The aggregate shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

The seepage pit cover shall be structurally sound and capable of supporting a dead load of 300 psf at the weakest point. Covers may be concrete (precast or cast-in-place) and shall be reinforced. A manhole with an opening of at least 20 inches in the shortest dimension shall be provided.

4. Construction Inspection - In cases where Engineer's Certification is <u>not</u> required, the Builder shall be responsible for verification of the foundation elevation of the structure to be served by the septic system. Health Department inspection will evaluate elevations of the system in relation to the established elevation.

IX. Alternative Systems - Alternative systems described in this section must be designed and submitted by a design professional. The construction of large or elaborate systems must be certified to the Monroe County Health Department by the design professional.

Alternative designs not discussed herein may be considered on a limited basis or for replacement systems on difficult sites but will be subject to the requirements of the Monroe County Health Department. Performance monitoring of these systems is required.

A. Raised Systems - A raised system is an absorption trench system constructed in clean sand fill material with acceptable permeability (Section IX A.5) placed on the natural soil on a building lot. It is used where site conditions preclude the construction of a conventional absorption field system due to excessively high percolation rates and/or high groundwater, bedrock

or impervious layer conditions. The three categories of raised systems are Tight Soil Systems, Marginal Soil Systems and Modified Systems.

1. Tight Soil Systems (Figures 15 & 16)

   a. Site Requirements - The percolation rate at the conventional depth of approximately 24 inches is greater than 60 min./in. but the percolation rate at a depth of 12 inches in the original soil is 60 min./in. or less.

      The maximum high ground water level must be at least one foot below the original ground surface.

      The change of elevation of the original ground across the system, including the taper, shall not exceed four feet.

      All minimum horizontal and vertical separations as described on Tables 2 and 3 respectively can be maintained.

      This system requires at least a 100-foot separation between any point on the sand fill system and any property line, including the street line.

   b. Design Criteria - The design for the fill basal area shall be based on an application rate of 0.1 gpd/sq.ft. A sand fill taper (material of the same quality as the bed) shall extend for at least 15 feet from the lowest side of the bed. A slope of one vertical to three horizontal for the taper may be used on severely sloping sites. The taper edge must parallel existing contours.

      Tight soil berms (clay or silt clay), at least five feet wide and as deep as the sand fill, shall be constructed around the perimeter of the remaining three sides of the fill system. Slopes shall not exceed one vertical to three horizontal.

      The depth of the fill must be at least 30 inches with at least 18 inches of fill under all parts of the absorption system.

      The design for the trench length is based on a two-foot wide trench with an application rate of 0.6 gpd/sq.ft.

Trenches shall be designed as specified in Section VIII A.2 except as noted above and constructed at least five feet inside the perimeter of the fill area.

2. Marginal Soil Systems (Figures 15 & 16)

a. Site Requirements - The percolation rate at the conventional depth of approximately 24 inches is between 46 min./in. and 60 min./in.

The maximum high groundwater level must be at least one foot below the original ground surface.

The change of elevation of the original ground across the system, including the taper, shall not exceed four feet.

All minimum horizontal and vertical separations as described on Tables 2 and 3 respectively can be maintained.

b. Design Criteria - The design for the fill area shall be based on an application rate of 0.1 gpd/sq.ft. A sand fill taper (material of the same quality as the bed) shall extend for at least 15 feet from the lowest side of the bed. A slope of one vertical to three horizontal for the taper may be used on severely sloping sites. The taper edge must parallel existing contours.

Tight soil berms (clay or silt clay), at least five feet wide and as deep as the sand fill, shall be constructed around the perimeter of the remaining three sides of the fill system. Slopes shall not exceed one vertical to three horizontal.

The depth of the fill must be at least 30 inches with at least 18 inches of fill under all parts of the trench system.

The design for the trench length is based on a two- foot wide trench with an application rate of 0.6 gpd/sq.ft.

Trenches shall be designed as specified in Section VIII A.2 except as noted above and constructed at least five feet inside the perimeter of the fill area.

3. Modified Systems (Figure 17) - Used with percolation rates between one min./in. and 45 min./in. but with bedrock, groundwater or impervious layers which preclude the use of conventional subsurface treatment systems.

   a. Site Requirements - The percolation rate at the conventional depth of approximately 24 inches shall be between one min./in. and 45 min./in.

      The maximum high groundwater level must be at least one foot below the original ground surface.

      The original ground elevation change across the system including the taper shall not exceed four feet.

      All minimum horizontal and vertical separations as described on Tables 2 and 3 respectively can be maintained.

   b. Design Requirements - The design for the trench length is based on the percolation rate of the subsoil, with a maximum design rate of 30 min./in. and a minimum of 15 min./in.

      The trench shall be designed as described in Section VIII A.2. except as noted above.

      The design area for the fill shall be based on the configuration of the absorption trenches. The perimeter of the fill shall extend at least five feet from all edges of the trenches. A sand fill taper (material of the same quality as the bed) shall extend for at least 10 feet from the lowest side of the bed. A slope of one vertical to three horizontal for the taper may be used on severely sloping sites. The taper edge must parallel existing contours.

      Tight soil berms (clay or silt clay), at least five feet wide and as deep as the sand fill, shall be constructed around the perimeter of the remaining three sides of the fill system. Slopes shall not exceed one vertical to three horizontal.

      The depth of the sand shall be at least one foot and sufficient to allow the trenches to

be constructed so that the vertical separations described in Table 3 are maintained.

4. Construction - Before any other work is performed in the fill system area, swales shall be constructed to divert surface water around the system and provide drainage away from the system.

   Except for the tractor used to prepare the basal area, heavy construction equipment shall not be allowed within the area of the system. The original soil must be left in place and plowed to a depth of six to eight inches with at least a double bottomed blade/furrow plow with the furrow turned upslope. The soil must not be wet when plowed.

   No standing water in the fill area is allowed.

   Fill material must be placed on the edge of the prepared base and pushed into place by a bulldozer while maintaining at least six inches of fill under the tracks.

   The absorption trenches shall be constructed in the fill material. Trenches shall not be constructed if frost has penetrated the fill more than three inches. The trenches shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

   The entire surface of the fill system, except the taper, shall be covered with a minimum of six inches of topsoil mounded to enhance runoff from the system and seeded to grass. Tapers shall be covered with three to six inches of topsoil.

5. Sand Fill Quality - Fill shall consist of clean uniform medium to coarse sand which passes the test described below:

   The standard testing device is a plastic 500 ml. graduated cylinder with eight 1/8-inch diameter holes drilled through the bottom.

   Approximately one inch of clean gravel (1/4"-1/2" in size) is placed in the bottom of the cylinder.

Water is added to the sand sample to a point where the sand is wet but not saturated. The sample is then mixed.

The sample is compacted in three lifts of approximately three inches each. Compaction is achieved by ramming each lift with a wooden dowel or other similar instrument. The dowel is of a slightly smaller diameter than the cylinder.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed over the compacted sand.

The cylinder is supported upright over a basin or can to catch the test water. The cylinder bottom is not to become immersed in water.

Water is poured into the cylinder and allowed to percolate through the sand until saturation is obtained.

Approximately two inches of water is added above the gravel and the time for that water to drop one inch is recorded.

The sand fill is regarded as acceptable if the stabilized rate for one-inch drop in the test cylinder is greater than one min./in. and less than 15 min./in. All fill shall pass the 1/4-inch sieve.

6. Inspection Format - The following inspections shall be conducted by Monroe County Health Department staff or the design professional:

Sand sample test before placing fill on building lot (optional).

Base inspection to insure proper location and that the basal area is plowed.

Sand sample after one or two loads are delivered to site.

Inspection of fill after it has been shaped but before installation of the trenches. Another sand sample shall be collected.

Inspection of trenches, distribution box, septic tank, piping and other appurtenances.

Inspection of the final grading, depth of topsoil, swales and any other item deemed appropriate by the Monroe County Health Department.

B. Mounds (Figures 18, 19 & 20) - A mound (system) is a soil absorption system that is elevated above the natural soil surface in a suitable fill material. The purpose of the design is to overcome site restrictions that prohibit the use of conventional soil absorption systems. Such restrictions include slowly permeable soils, shallow permeable soils over bedrock and permeable soils with high water table. In slowly permeable soils, the mound serves to improve absorption of sewage effluent by utilizing the more permeable topsoil and eliminating distribution system construction in the wetter and more slowly permeable subsoil, where smearing and compaction are often unavoidable. On sites with permeable soils where there is insufficient separation to ground water or bedrock, the fill material in the mound provides the treatment.

1. Site Requirements - A mound system may be used where <u>all</u> of the following conditions are met:

   a. The maximum high groundwater level must be at least one foot below the original ground surface.

   b. Bedrock shall be at least two feet below the natural ground surface if public water is available and three feet if water is provided by a private well.

   c. The percolation rate of the naturally occurring soil is faster than 120 min./in. measured at a depth of 16" to 24".

   d. The natural ground slopes do not exceed 6 percent for soils with percolation rates slower than 60 min./in. and 12 percent for soils with percolation rates faster than 60 min./in.

   e. All minimum horizontal separation distances from edge of the basal area as described in Table 2 can be maintained.

2. Fill Material Requirements

   a. Below the absorption area - The fill material shall consist of uniform medium to coarse sand which passes the test described below:

The standard testing device is a plastic 500 ml. graduated cylinder with eight 1/8-inch diameter holes drilled through the bottom.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed in the bottom of the cylinder. Water is added to the sand sample to a point where the sand is wet but not saturated. The sample is then mixed.

The sample is compacted in three lifts of approximately three inches each. Compaction is achieved by ramming each lift with a wooden dowel or other similar instrument of slightly smaller diameter than the cylinder.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed over the compacted sand.

The cylinder is supported upright over a basin or can to catch the test water. The cylinder bottom is not to become immersed in water.

Water is poured into the cylinder and allowed to percolate through the sand until saturation is obtained.

Approximately two inches of water is added above the gravel and the time for that water to drop one inch is recorded.

The test is repeated until stabilization is obtained.

The sand fill is regarded as acceptable if the stabilized rate for one-inch drop in the test cylinder is greater than 1 min./in. and less than 15 min./in. All fill shall pass the 1/4- inch sieve.

b. Above the absorption area - The fill material for the cap must consist of finer textured soils such as clay or silt loam. This material will encourage plant growth due to its higher water-holding capacity and increase runoff due to its more dense nature.

3. Design Criteria

a. Absorption Area - The size of the absorption area is based on the 15 min./in. maximum percolation rate of the fill material.

b. System Configuration - The absorption area within the mound can be in the form of a bed or trenches.

For slowly permeable soils, the encroachment of the ground water is more severe than on permeable soils. In order to minimize this encroachment, two or three narrow parallel trenches are used instead of a bed. The trenches are sufficiently spaced so the effluent is absorbed by the natural soil before it reaches the down slope trench.

For permeable soils the high water encroachment is not as great so a narrow rectangular bed could be used. Bed widths should not exceed 10 feet.

For shallow permeable soils over bedrock either configuration can be used. If a bed is selected, it can be rectangular or square because water table encroachment is usually not a problem.

Trenches and beds must be designed to run parallel to the contours of the site so as not to concentrate the effluent as it moves laterally downslope into a small area. The bottom of the absorption area within the bed or trenches must be level so that one area is not overloaded.

c. Basal Area - The basal area is the natural soil/fill interface of the mound. Its function is to accept the effluent from the fill, further treat the effluent and transfer the effluent to the subsoil beneath the mound and laterally to the subsoils outside of the mound area. The basal area for a system on level ground includes all the area beneath the absorption bed or trenches and the area under the tapers. On a sloping site, the basal area includes only the area under the absorption bed/trenches and the lower or downhill taper. The basal area design is based on the percolation rate of the naturally occurring soils. Where the

percolation rate is 45 min./in. or faster, refer to Table 6. For soils of 46-120 min./in., a rate of 0.2 gpd/sq.ft. shall be used for determining the basal area required.

d. Distribution System - A pressure distribution network consisting of perforated small diameter laterals is required. With pressure distribution, the effluent is spread more uniformly over the entire absorption area to minimize saturated flow through the fill and short circuiting, thus assuring good treatment and absorption. Approximately four doses per day is considered ideal.

e. A dual-chamber septic tank or two tanks in series in addition to the dosing tank shall be provided.

f. The design professional shall consult with the Monroe County Health Department for details of mound and hydraulic design, subbase preparation and construction techniques.

4. Construction

a. Except for the tractor used to prepare the basal area, heavy construction equipment shall not be allowed within the basal area and the area downslope of the system which will act as the dispersal area for the mound.

b. The vegetation shall not be scraped away, roto-tilled or compacted. Excess vegetation shall be removed with trees cut at the ground surface but stumps left in place. The area shall be plowed to a depth of six to eight inches with a double bottomed blade/furrow plow with the furrow turned upslope.

c. The fill material is placed from the upslope side of the system to the full depth required in the design and shall extend to the edge of the basal area at a slope not to exceed one vertical to three horizontal.

d. The absorption area is then formed within the mound. A minimum of six inches of aggregate shall be placed beneath the distribution lines.

e. The pressure distribution lines are placed parallel to the contours of the slope and a minimum of two inches of aggregate is placed above the lines.

f. The aggregate shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

g. On sloping sites a diversion ditch or curtain drain shall be installed uphill of the absorption area to prevent surface water runoff from reaching the absorption area.

h. A minimum of six inches of finer materials such as clay loam is placed over the top of the absorption area and the entire mound, including the tapers, is then covered with six inches of top soil and seeded to grass.

C. Intermittent Sand Filters (Chemung Spill & Fill or Two Stage) (Figure 21) - In an intermittent sand filter, the septic tank or aerobic unit effluent is intermittently spread across the surface of a bed of sand through a network of distributor lines. Collector pipes beneath the filter collect treated effluent after it has passed through the sand. This effluent is then discharged to a small raised fill system. An intermittent sand filter is used where site conditions preclude the construction of other alternative systems due to original ground elevation change in excess of four feet.

1. Site Requirements - The natural ground slopes shall not exceed 15 percent. The percolation rate for the second stage at the conventional depth of approximately 24 inches is greater than 60 min./in. but the percolation rate at a depth of 12 inches in the original soil is 60 min./in. or less.

   All minimum horizontal and vertical separations as described in Tables 2 and 3 respectively can be maintained.

   The minimum required vertical separation to groundwater must be met from the bottom of the collector pipes.

Minimum separation distances for all components of this system are as noted in Table 2 with the exception of the second stage. This bed requires at least a 100-foot separation between any point on the system and any property line, including the street line.

2. Design Criteria

a. First Stage, Sand Filter (Figure 22) - Distributor lines shall be placed at three foot centers as level as possible (maximum slope of 1/32 in./ft.).

Collector pipes shall be placed at a maximum of 12- foot centers and at least two underdrains must be provided.

The sand media shall have an effective grain size of 0.25 mm to 1.0 mm (preferably 0.5 mm to 1.0 mm). All sand shall pass a 1/4-inch sieve.

The uniformity coefficient of the sand shall not exceed 4.0.

The design for the sand area shall be based on an application rate of 0.84 gpd/sq. ft.

b. Second Stage, Raised System (Figure 23) - The configuration for the fill area shall be based on the design of the absorption trenches. A sand fill taper (material of the same quality as the bed) shall extend at least 15 feet from the lowest side of the bed. A slope of one vertical to three horizontal for the taper may be used on severely sloping sites. The taper edge must parallel existing contours.

Tight soil berms (clay or silt clay), at least five feet wide and as deep as the sand fill, shall be constructed around the perimeter of the remaining three sides of the fill system. Side slopes shall not exceed one vertical to three horizontal.

The depth of the fill must be at least 30 inches with at least 18 inches of fill under all parts of the trench system. The design for the sand area shall be based on an application rate of 0.56 gpd/sq.ft.

Trenches shall be five feet on centers and designed for an application rate of 1.67 gpd/sq.ft.

A plan view with cross-sectional and longitudinal views showing the above details shall be provided for each system.

3. Construction

a. First Stage, Sand Filter - After excavation, the collector pipe shall be placed in aggregate.

There shall be a minimum of two inches of aggregate above and below the collectors.

A three-inch layer of washed gravel or crushed stone (1/8" to 1/4" in size) is carefully placed on top of the aggregate.

A minimum of 24 inches of approved sand is placed above the crushed stone.

The distributor pipes are placed in a layer of graded gravel that provides a minimum of four inches across the entire surface of the filter and at least two inches above the below the distributor pipes.

The aggregate shall be covered with a barrier material that prevents soil from entering the aggregate after backfilling yet permits air and moisture to pass through. Polyethylene and treated building paper are relatively impervious and shall not be used.

The entire surface of the filter shall be covered with six to twelve inches of topsoil, mounded to enhance the runoff of rainwater from the system and seeded to grass.

b. Second Stage, Raised System - Before any other work is performed in the fill system area, swales shall be constructed to divert surface water around the system and provide drainage away from the system.

Except for the tractor used to prepare the basal area, heavy construction equipment shall not be allowed within the area of the system. The original soil must be left in

place and plowed to a depth of six to eight inches with at least a double bottomed blade/furrow plow with the furrow turned upslope. The soil must not be wet when plowed.

No standing water in the fill area is allowed.

Fill material must be placed on the edge of the prepared base and pushed into place by a bulldozer while maintaining at least six inches of fill under the tracks.

The absorption trenches shall be constructed in the fill material. Trenches shall not be constructed if frost has penetrated the fill more than three inches.

The entire surface of the fill system, except the taper, shall be covered with a minimum of six inches of topsoil mounded to enhance runoff from the system and seeded to grass. Tapers shall be covered with three to six inches of topsoil.

4. Sand Fill Quality, Second Stage - Fill shall consist of clean uniform medium to coarse sand which passes the test described below:

The standard testing device is a plastic 500 ml. graduated cylinder with eight 1/8-inch diameter holes drilled through the bottom.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed in the bottom of the cylinder.

Water is added to the sand sample to a point where the sand is wet but not saturated. The sample is then mixed.

The sample is compacted in three lifts of approximately three inches each. Compaction is achieved by ramming each lift with a wooden dowel or other similar instrument. The dowel is of a slightly smaller diameter than the cylinder.

Approximately one inch of clean gravel (1/4"-1/2" in size) is placed over the compacted sand.

The cylinder is supported upright over a basin or can to catch the test water. The cylinder bottom is not to become immersed in water.

Water is poured into the cylinder and allowed to percolate through the sand until saturation is obtained.

Approximately two inches of water is added above the gravel and the time for that water to drop one inch is recorded.

The sand fill is regarded as acceptable if the stabilized rate for one-inch drop in the test cylinder is greater than one min./in. and less than 15 min./in. All fill shall pass the 1/4-inch sieve.

X. Other Systems

A. Holding tanks - The use of holding tanks shall not be permitted for new home construction except where occupancy of a home is permitted while the sewage treatment system is under construction. Tank size shall be based upon five days' design flow or 1,250 gallons, whichever is greater, and meet the same construction criteria as a septic tank except that the holding tank shall not have an outlet. Holding tanks are not acceptable for long term use on year-round or seasonal residences.

The owner must enter into a contract with a New York State Department of Environmental Conservation permitted waste hauler to remove waste as often as necessary to prevent sewage from overflowing onto the ground surface.

A high water alarm system shall be required.

B. Non-Waterborne Systems - Where running water is either not available or too scarce to economically support flush toilets or where there is a need or desire to conserve water, the installation of non-waterborne sewage systems may be considered. Treatment for wastewater from sinks, showers and other fixtures must be provided when non-flush toilets are installed (household wastewater without toilet wastes is know as greywater).

C. Composters - These units shall be installed in accordance with the manufacturer's instructions. The

units shall have a label indicating compliance with the requirements of National Sanitation Foundation (NSF) Standard 41 or equivalent. Only units with a warranty of five years or more shall be installed.

D. Chemical and Recirculating Toilets - Chemical toilets provide a toilet seat located directly above a vault containing chemicals to disinfect and deodorize the wastewater. Recirculating toilets use chemicals as the toilet flush fluid. The wastes are separated from the fluid and discharged to an internal holding tank; fluids are reused.

The chemicals used in these types of toilets do not provide complete disinfection, therefore waste products from these units shall not be discharged to surface waters or to the ground surface.

The reduced wastewater volume from recirculating toilets may be discharged to a larger holding tank but not to a subsurface absorption system.

E. Incinerator Toilets - These units provide a chamber where human waste is burned. They have a limited capacity and require a source of electricity or gas. The ash remains must be periodically removed. The units must be installed according to the manufacturer's instructions.

F. Greywater Systems - Greywater systems shall be designed on a flow rate of 75 gpd/bedroom and meet all the criteria previously discussed for treatment of household wastewater.

G. Experimental Systems - A treatment system of a type not discussed in this document may be allowed only through the issuance of a Specific Waiver by the Monroe County Department of Health.

1. Special Conditions - The system shall be designed by a licensed professional.

An environmental assessment must determine that the development of the site with this system is consistent with the overall development of the area and will cause no adverse environmental impact. The homeowner/purchaser shall be informed of the expected reliability and potential problems associated with the design.

The design professional supervises the installation of the system, certifies that the

system was built in accordance with the approved plan and submits as-built plans of the system.

2. Interim Approval - Based upon submission of engineering research and testing data indicating that certain products, designs and performances are equivalent to these standards, the Director may grant interim approval for the use of systems, products or procedures differing from these standards.

XI. Hardship - The Hardship Policy, as applied by the Monroe County Health Department since the County Sanitary Code Revision of 1976, is formally abolished with the implementation of the provisions contained in this document.

- INDEX -

APPENDICES

APPENDIX A

Table 1: Minimum Design Flows for Various Plumbing Fixtures

Plumbing Fixtures	Effective Date(s)	Design Flows (G.P.D. per Bedroom)
Standard Fixtures - 3.5+ gal. per flush water closets and - 3.0+ gpm faucets/showerheads	Prior to 1980	150
Standard Fixtures - 3.5+ gpf max. water closets and - 3.0+ gpm max.faucets/showerheads	1980 - 1991	130
Water Saving Fixtures - 1.6+ gpf max. water closets and - 3.0+ gpm max.faucets/showerheads	1991 - Present	110
Waterless Toilet (i.e. composter) with - 3.0+ gpm faucets/showerheads	Present	75 (greywater only)

Note(s): 1. The volume of existing or proposed hot tubs / spas should be added to the total design flow calculated from this table.

TABLE 2

MINIMUM SEPARATION DISTANCES FROM WASTEWATER SYSTEM COMPONENTS

SYSTEM COMPONENTS	WELL OR SUCTION LINE	STREAM, LAKE WETLAND OR WATERCOURSE (d)	DWELLING	P/L	POOL OR SPA
House sewer (watertightjoints)	25' if CI pipe 50' otherwise	25'	----	10'	10'
Septic tank	50'	50'	10'	10'	10'
Effluent line to distribution box	50'	50'	10'	10'	10'
Distribution box	100'	100'	20'	10'	10'
Absorption field	100'(b)	100'	20'	10'	10'
Seepage pit	150'(c)	100'	20'	10'	10'
Dry well (roof & footing)	50'	25'	20'	10'	10'
Raised System - Tight Soil System (a)	100'(b)	100'	20'	100'	10'
Raised Systems - Marginal Soil System and Modified System (a)	100'(b)	100'	20'	10'	10'
Mound system (a)	100'(b)	100'	20'	100'	10'
Composter (outdoor)	50'	50'	20'	10'	10'

NOTES:

(a) Separation distances shall be measured from the edge of the sand fill.

(b) When sewage treatment systems are located in coarse gravel or up grade and in the general path of drainage to a well, the closest part of the treatment system shall be at least 200 feet away from the well.

(c) Seepage pits are not to be used in conjunction with well water supplies.

(d) Mean high water mark.

TABLE 3

MINIMUM VERTICAL SEPARATION FROM BOTTOM OF LEACH TRENCH

	Ground Water	Bedrock	Impervious Layer
Public Supply	2'	2'	2'
Private Supply	2'	4'	2'

TABLE 4

MINIMUM SEPTIC TANK CAPACITIES AND LIQUID SURFACE AREAS

Number of Bedrooms	Minimum Tank Capacity (Gallons)	Minimun Liquid Surface Area (sq.ft.)
1, 2 or 3	1,250	34
4	1,500	40
5	1,750	47
6	2,000	54

NOTES: Tank size requirements for more than six bedrooms shall be calculated by adding 250 gallons and seven square feet of surface area for each additional bedroom. Tank size requirements allow for the installation of garbage grinders.

TABLE 5
REQUIRED LENGTH OF ABSORPTION TRENCH
(based upon 2 ft. wide trench)

Percolation Rate Min./Inch	Flow Rate (Gals/Day)														
	2 bedrooms			3 bedrooms			4 bedrooms			5 bedrooms			6 bedrooms		
	220	260	300	330	390	450	440	520	600	550	650	750	660	780	900
1 - 5	92	108	125	138	162	187	184	216	250	230	270	312	275	325	374
6 - 7	110	130	150	165	195	225	220	260	300	275	325	375	330	390	450
8 - 10	123	145	167	184	217	250	245	290	333	306	360	417	367	433	500
11 - 15	138	162	188	207	244	281	275	325	375	344	406	469	413	488	563
16 - 20	158	186	214	236	279	321	315	372	429	393	464	536	472	557	643
21 - 30	184	217	250	275	325	375	367	433	500	459	542	625	550	650	750
31 - 45	220	260	300	330	390	450	440	520	600	550	650	750	660	780	900
46 - 60	245	290	333	367	433	500	489	578	667	612	722	833	734	867	1000*
	Dosing Not Required							Dosing or Alternate Design Required							

*Greater than 1,000 ft. of trench requires Alternate Dosing

TABLE 6

APPLICATION RATES FOR MISCELLANEOUS DESIGN FLOWS

PERCOLATION RATE minutes/inch	APPLICATION RATE gal./day/sq. ft.
1 - 5	1.20
6 - 7	1.00
8 - 10	0.90
11 - 15	0.80
16 - 20	0.70
21 - 30	0.60
31 - 45	0.50
Soil with a percolation of less than 1 min./in. is unsuitable for a conventional system	
Required Area (sq. ft.) = Flow Rate (GPD)/Application Rate (GPD/sq. ft.)	
Required Absorption Field Length = Required Area (sq. ft.)/2 ft. (trench width)	

TABLE 7

ABSORPTION BEDS APPLICATION RATES FOR DETERMINING REQUIRED BOTTOM AREA

Percolation Rate Minutes/Inch	Application Rate Gallons/Day/Sq. Ft.
1 - 5	0.95
6 - 7	0.80
8 - 10	0.70
11 - 15	0.60
16 - 20	0.55
21 - 30	0.45
Greater than 30	Not Acceptable

TABLE 8

SEEPAGE PITS FOR HOUSEHOLD SYSTEMS
REQUIRED ABSORPTIVE AREA
IN SQUARE FEET

Percolation Rate	Sewage Application Rate	2 bedroom GPD		3 bedroom GPD		4 bedroom GPD		5 bedroom GPD		6 bedroom GPD	
Min./In.	GPD/S.F.	260	300	390	450	520	600	650	750	780	900
1 - 5	1.20	216	250	325	375	433	500	542	625	650	750
6 - 7	1.00	260	300	390	450	520	600	650	750	780	900
8 - 10	0.90	290	333	433	500	578	667	722	833	867	1000
11 - 15	0.80	324	375	488	563	650	750	813	938	975	1125
16 - 20	0.70	372	429	557	643	743	857	928	1071	1115	1286
21 - 30	0.60	432	500	650	750	867	1000	1084	1250	1300	1500
31 - 45	0.50	520	600	780	900	1040	1200	1300	1500	1560	1800
OVER 45	* * * UNSUITABLE - USE SPECIAL DESIGN * * *										

TABLE 9

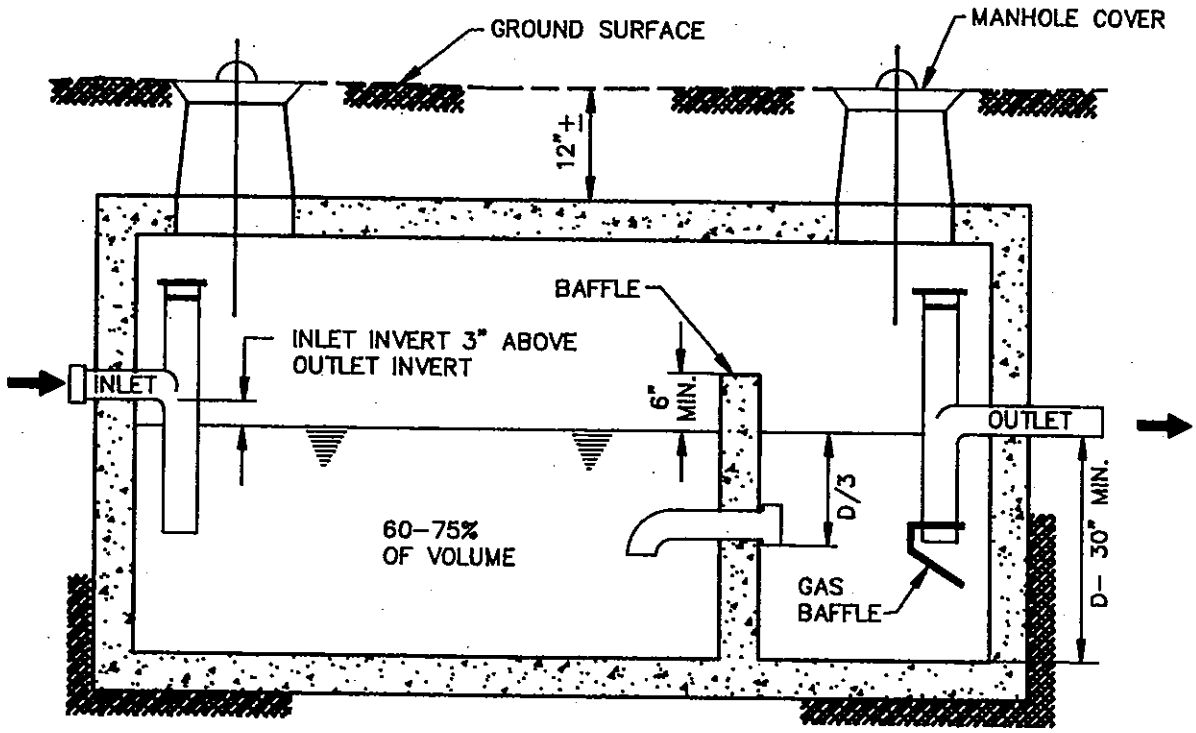
ABSORPTIVE AREA FOR
SELECTED
CYLINDRICAL SEEPAGE PITS
(IN SQUARE FEET)

Diameter of Seepage Pit	Effective Strata Depth - Invert of Inlet to Bottom of Seepage Pit									
(Feet)	1 Foot	2 Feet	3 Feet	4 Feet	5 Feet	6 Feet	7 Feet	8 Feet	9 Feet	10 Feet
3	9.4	19	28	38	47	57	66	75	85	94
4	12.6	25	38	50	63	75	88	101	113	126
5	15.7	31	47	63	79	94	110	126	141	157
6	18.8	38	57	75	94	113	132	151	170	188
7	22.0	44	66	88	110	132	154	176	198	220
8	25.1	50	75	101	126	151	176	201	226	251
9	28.3	57	85	113	141	170	198	226	254	283
10	31.4	63	94	126	157	188	220	251	283	314
11	34.6	69	104	138	173	207	242	276	311	346
12	37.7	75	113	151	188	226	264	302	339	377

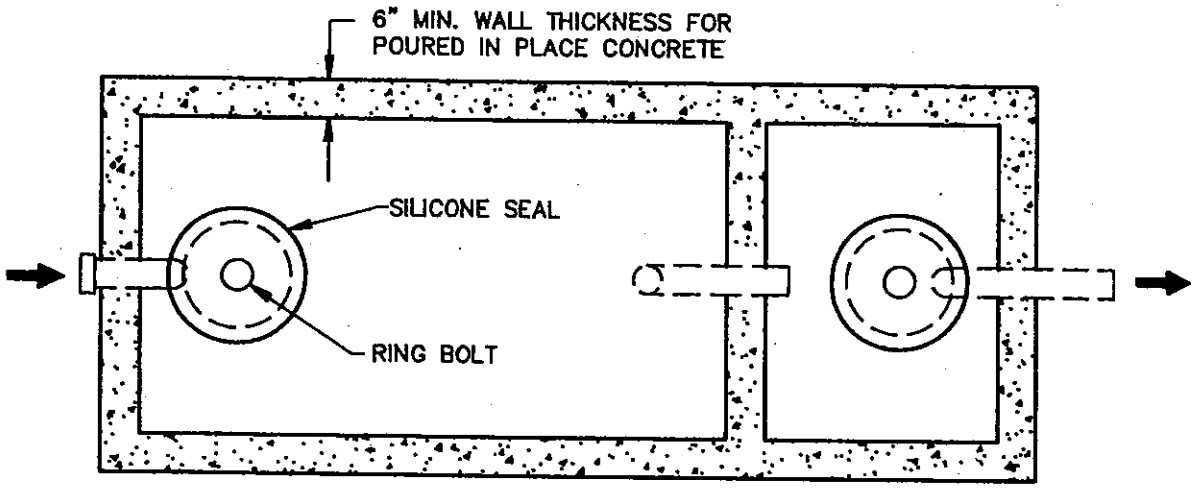
Absorptive Area for Cylinder = π D x h (π = 3.14)
Absorptive Area for Rectangle = (2w + 2l)h

h ≡ effective depth in feet
D ≡ outside diameter in feet
W ≡ outside width in feet
L ≡ outside length in feet

APPENDIX B



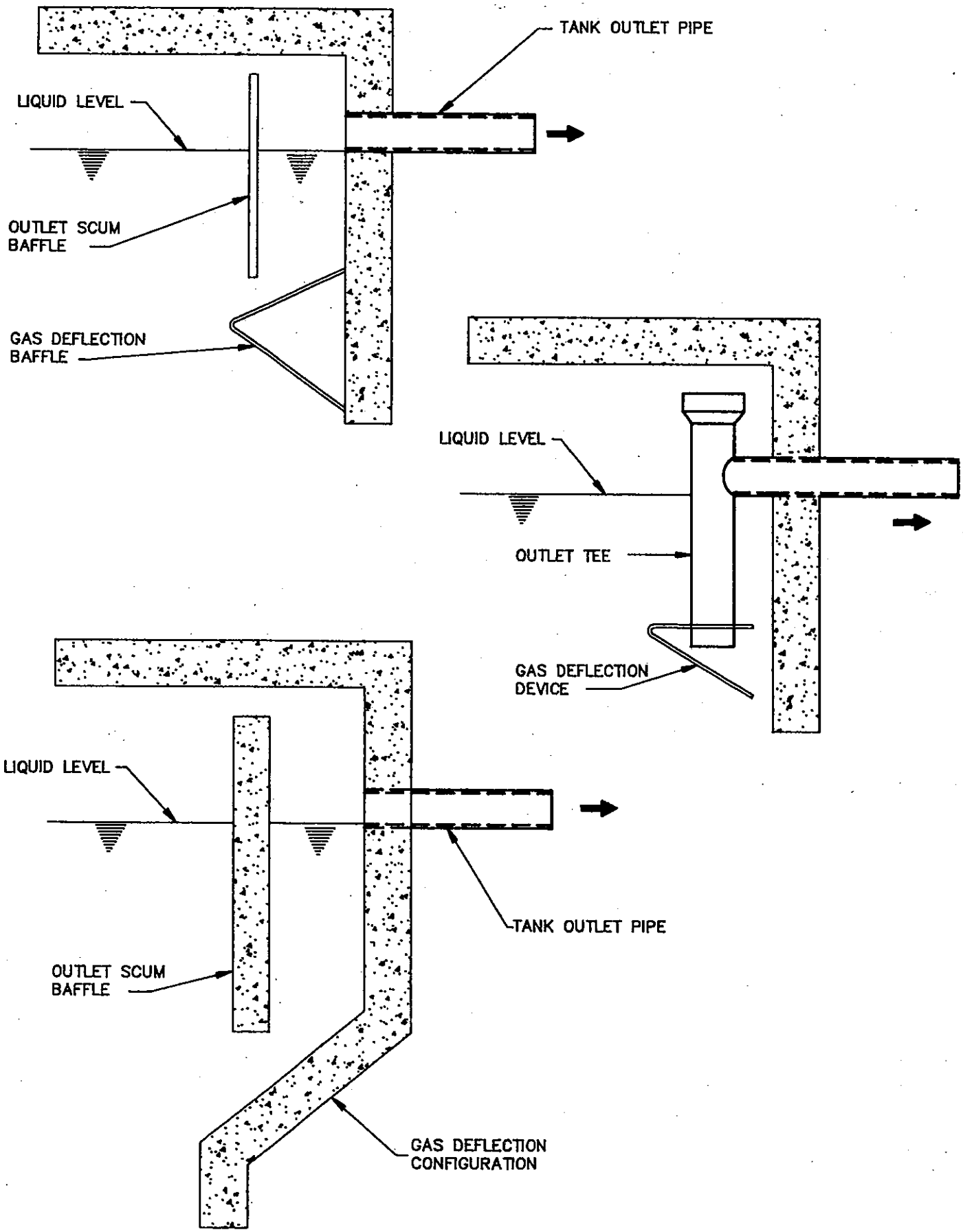
SECTION VIEW



PLAN VIEW

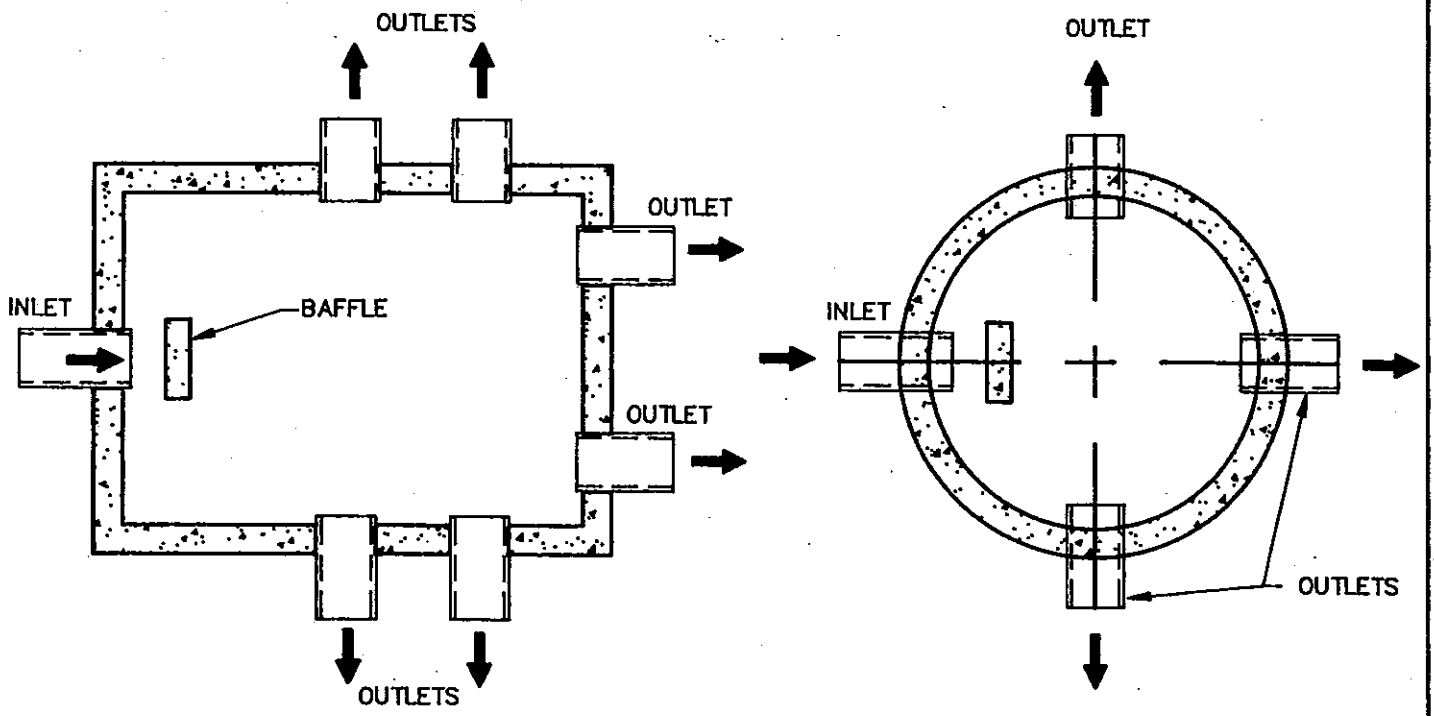
SEPTIC TANK DETAIL

FIGURE 2



OUTLET BAFFLE DETAIL

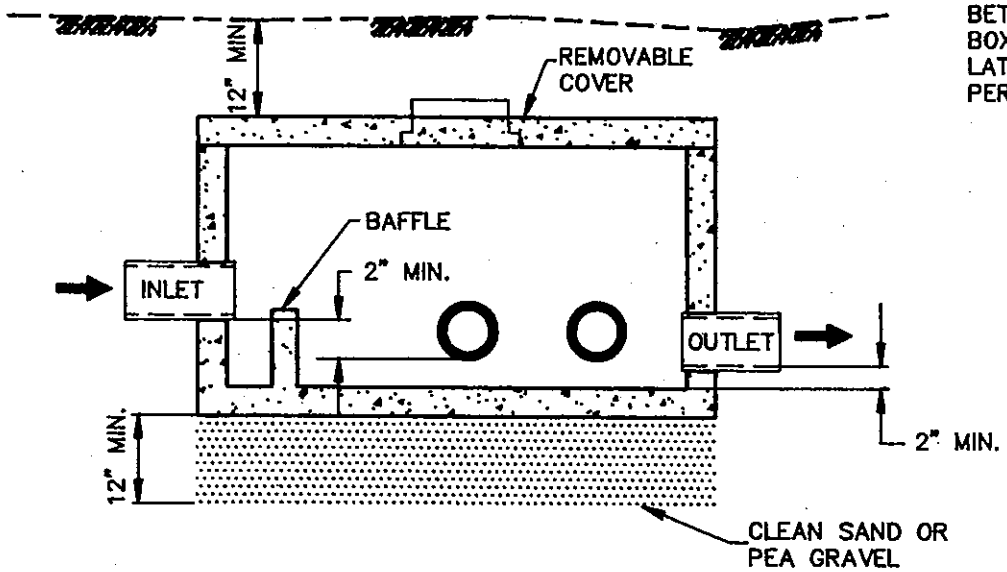
FIGURE 3



PLAN VIEW

NOTES:

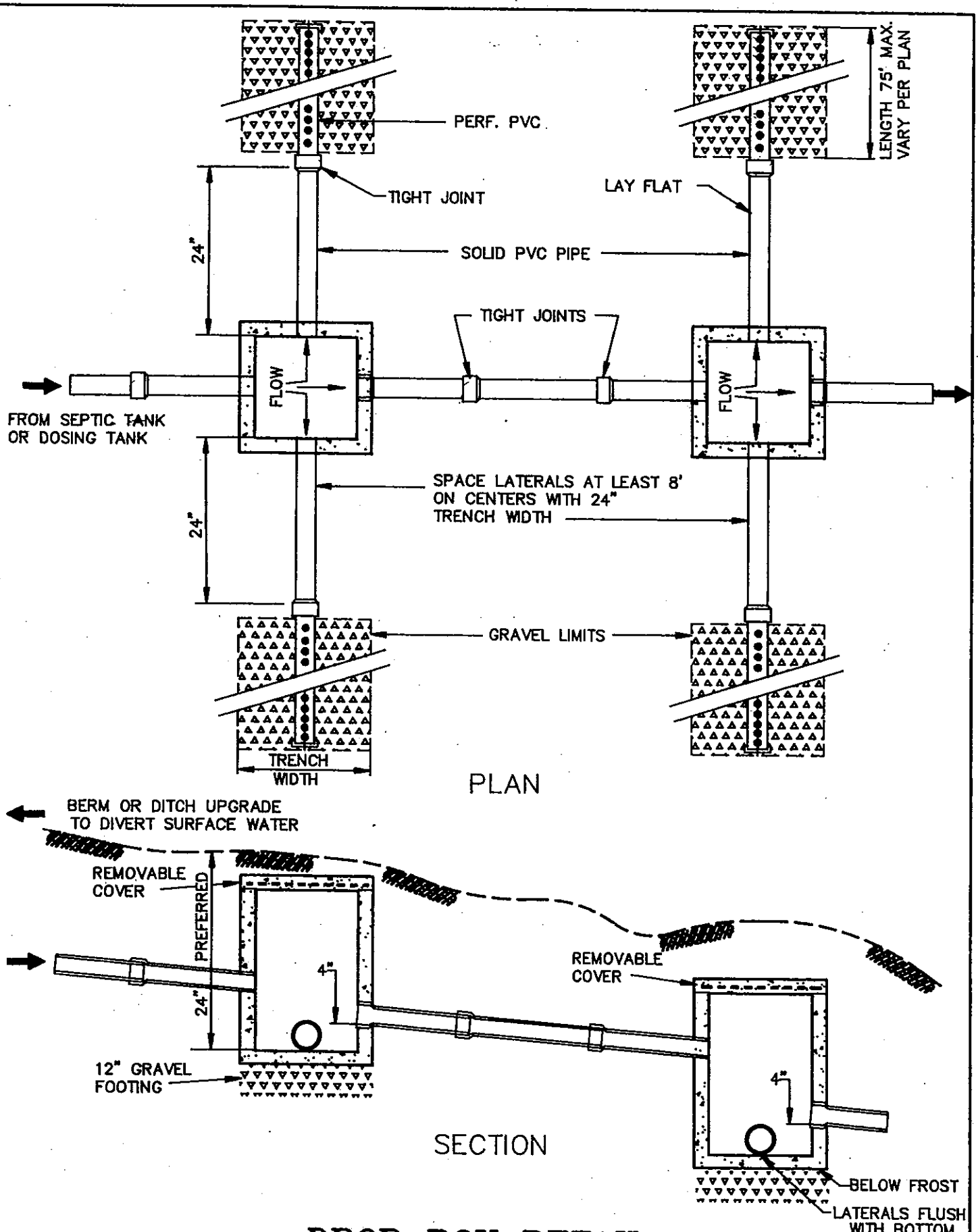
1. PIPE JOINTS TO BE SEALED WITH ASPHALTIC MATERIAL OR EQUIVALENT.
2. INVERT ELEVATIONS OF ALL PIPES MUST BE EQUAL.
3. THE SLOPES OF OUTLET PIPES BETWEEN THE DISTRIBUTION BOX AND DISTRIBUTOR LATERALS SHOULD BE 1/8" PER FOOT.



CROSS–SECTIONAL VIEW

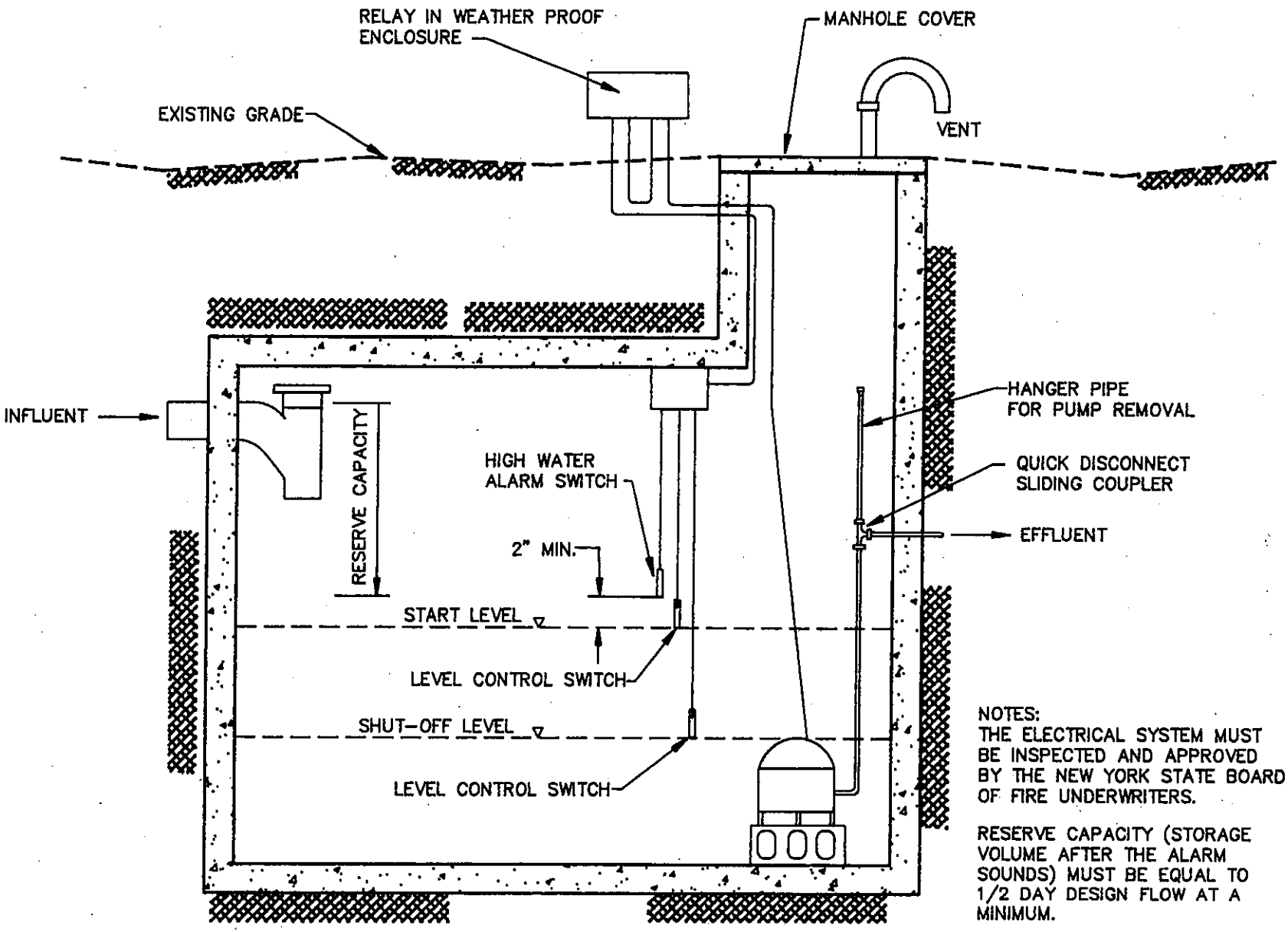
DISTRIBUTION BOX DETAIL

FIGURE 4



DROP BOX DETAIL

FIGURE 5



TYPICAL DOSING CHAMBER WITH PUMP

FIGURE 6

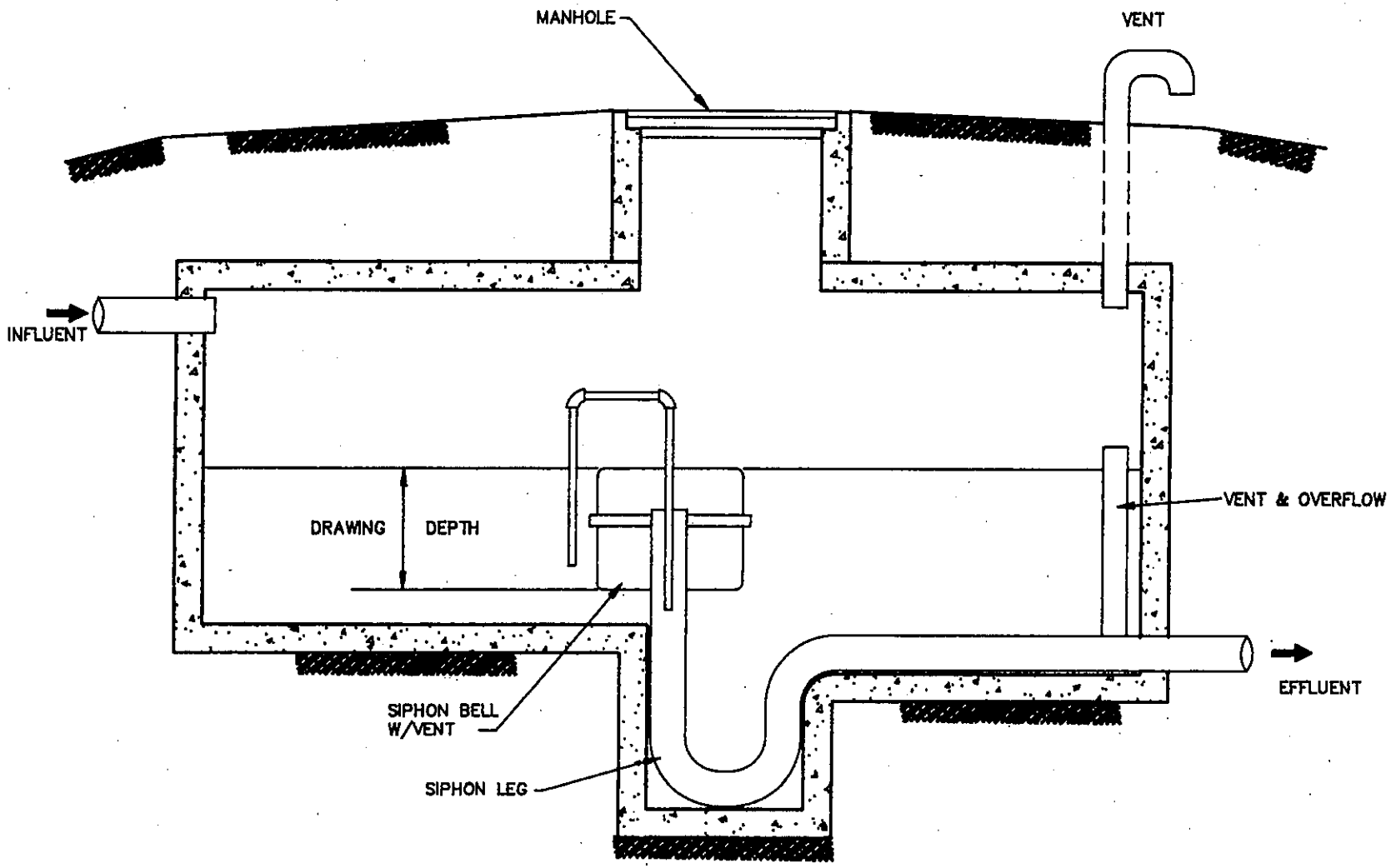


FIGURE 7

DOSING CHAMBER WITH SIPHON DETAIL

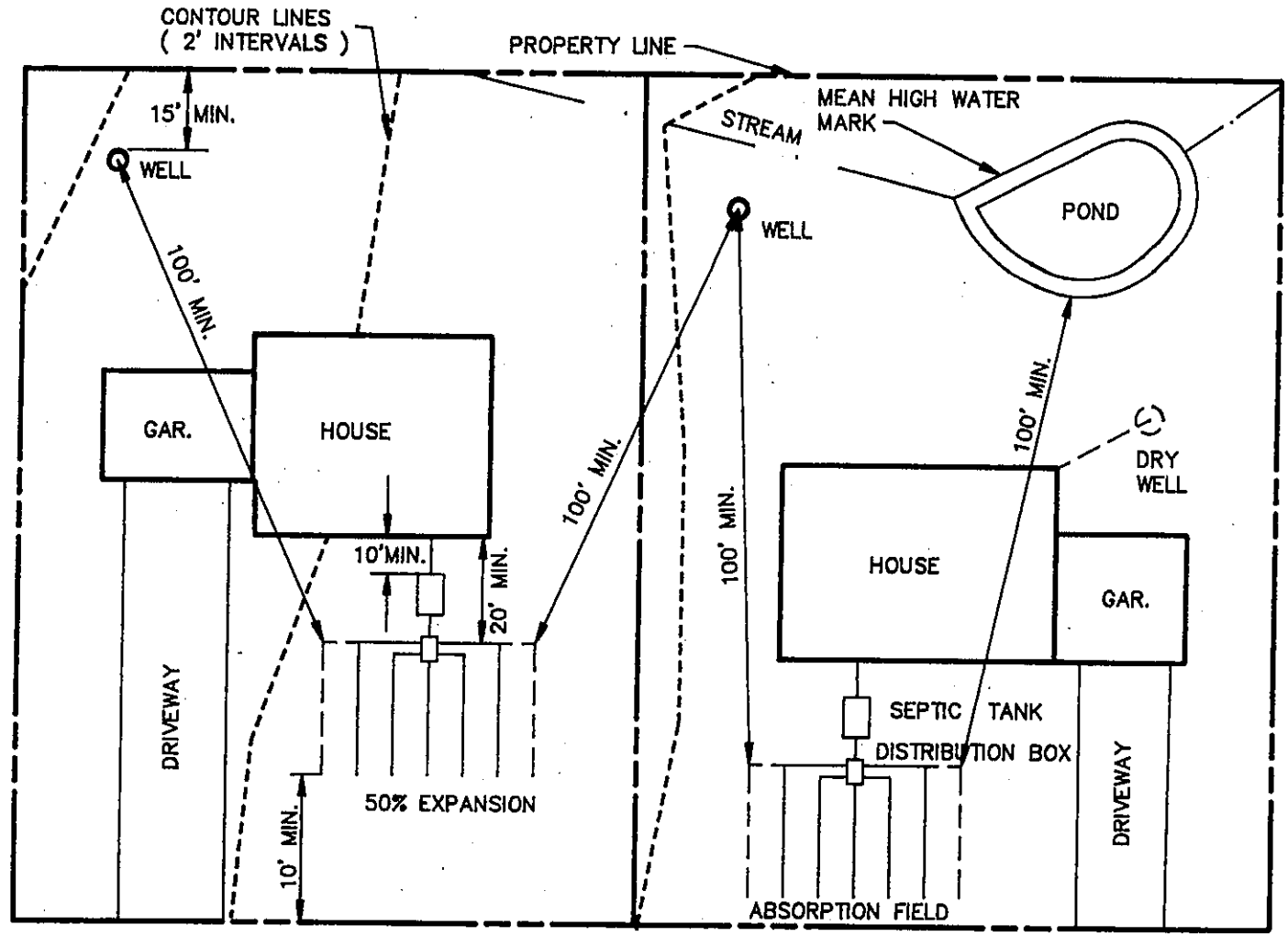
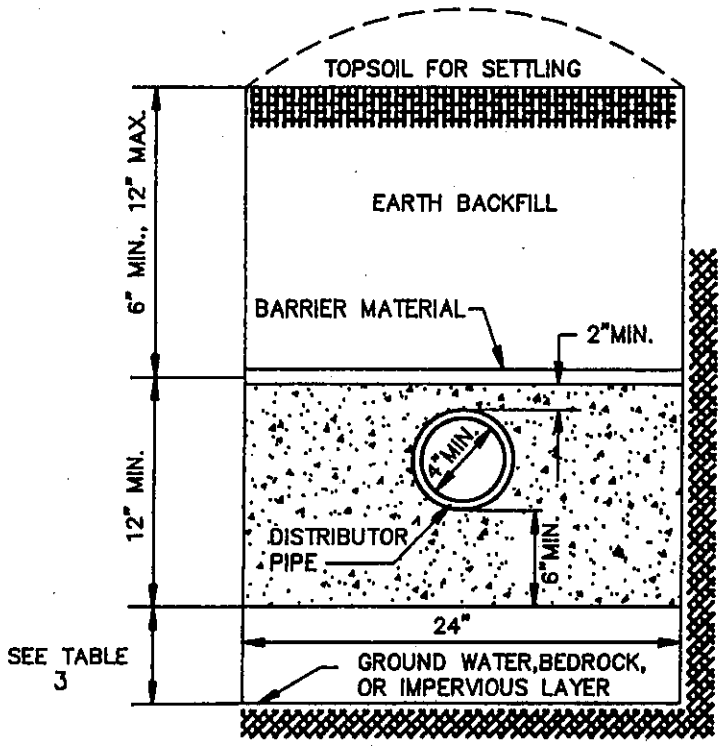
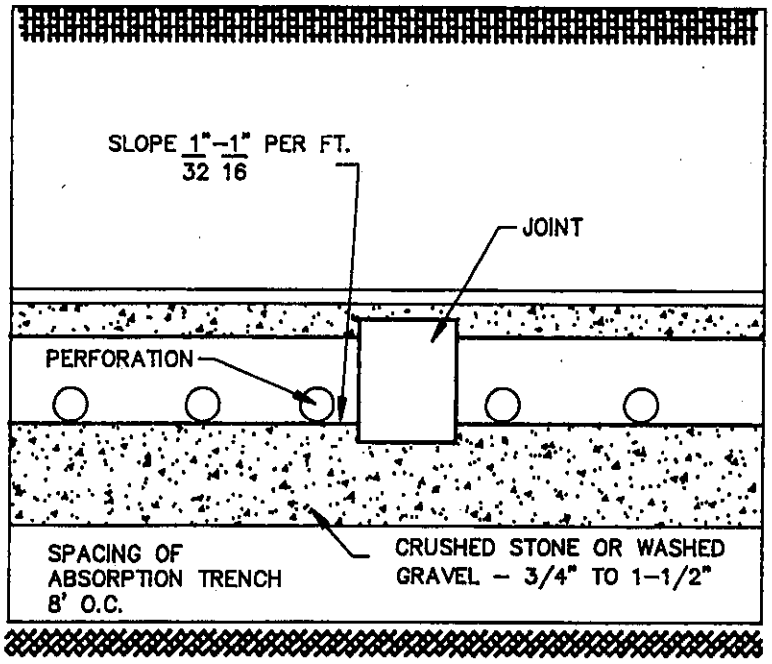


FIGURE 8

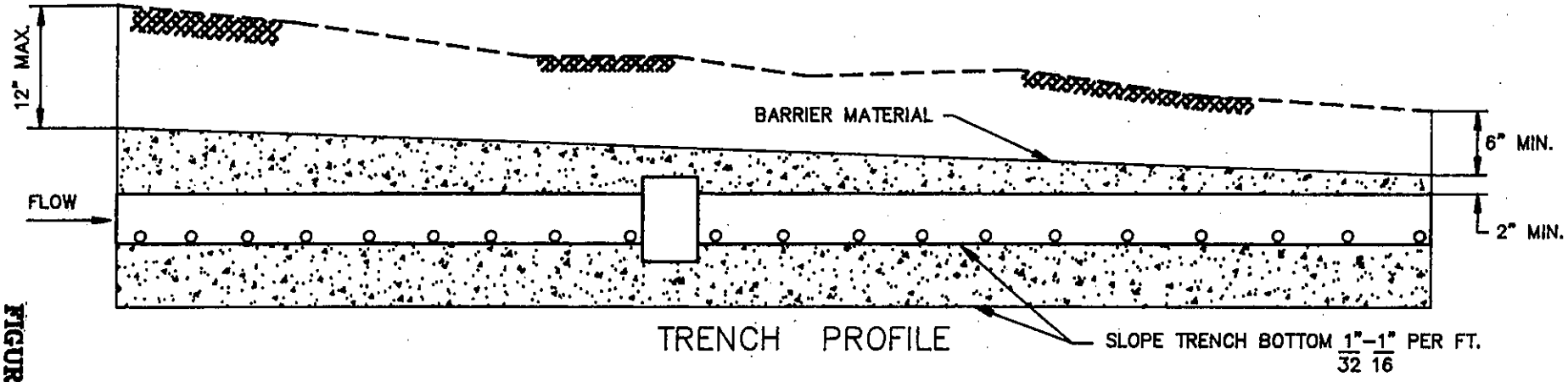
STANDARD ABSORPTION TRENCH SYSTEM – SEPARATION REQUIREMENTS



CROSS SECTIONAL VIEW



LONGITUDINAL VIEW



TRENCH PROFILE

ABSORPTION TRENCH DETAIL

FIGURE 9

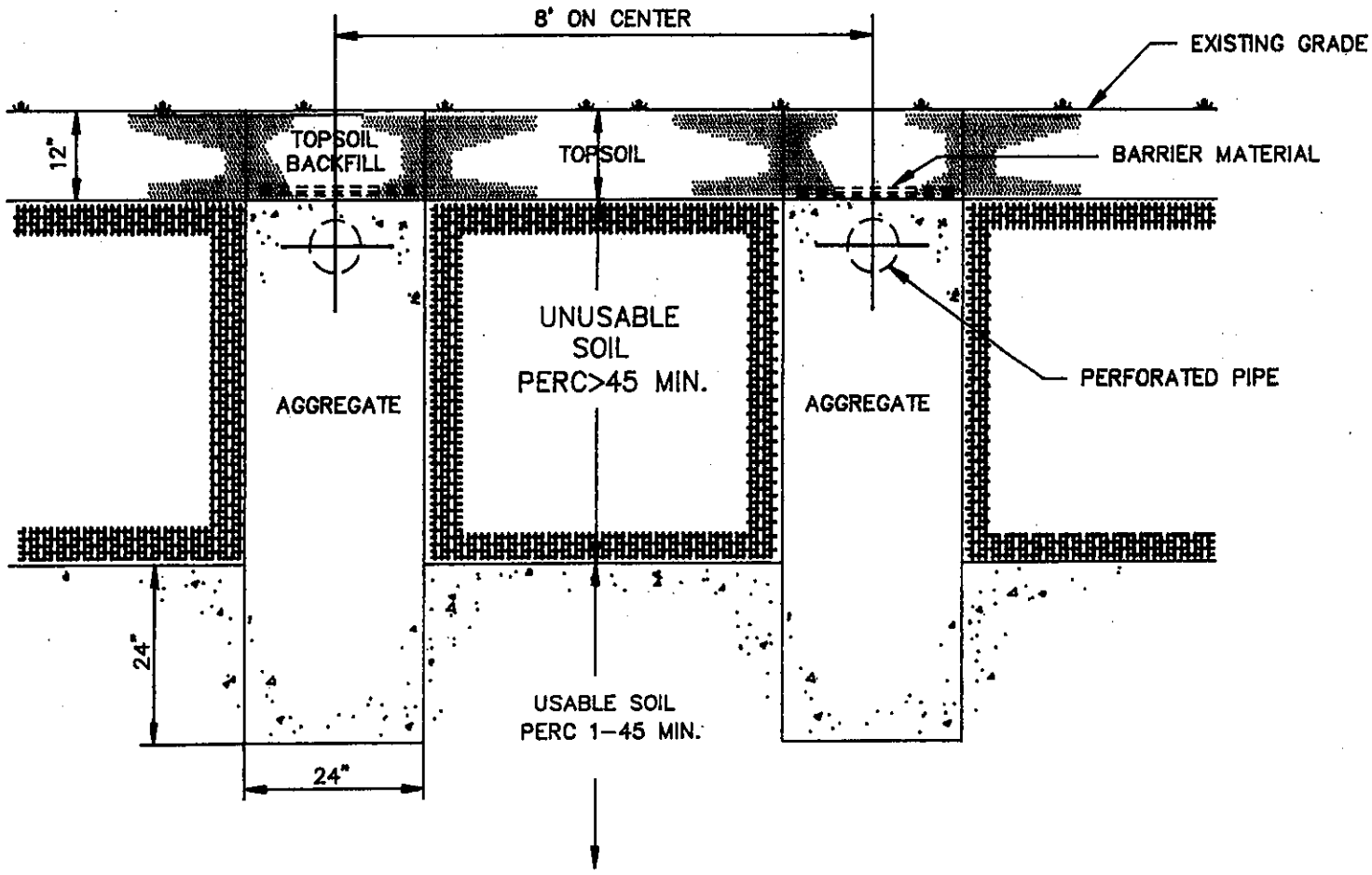
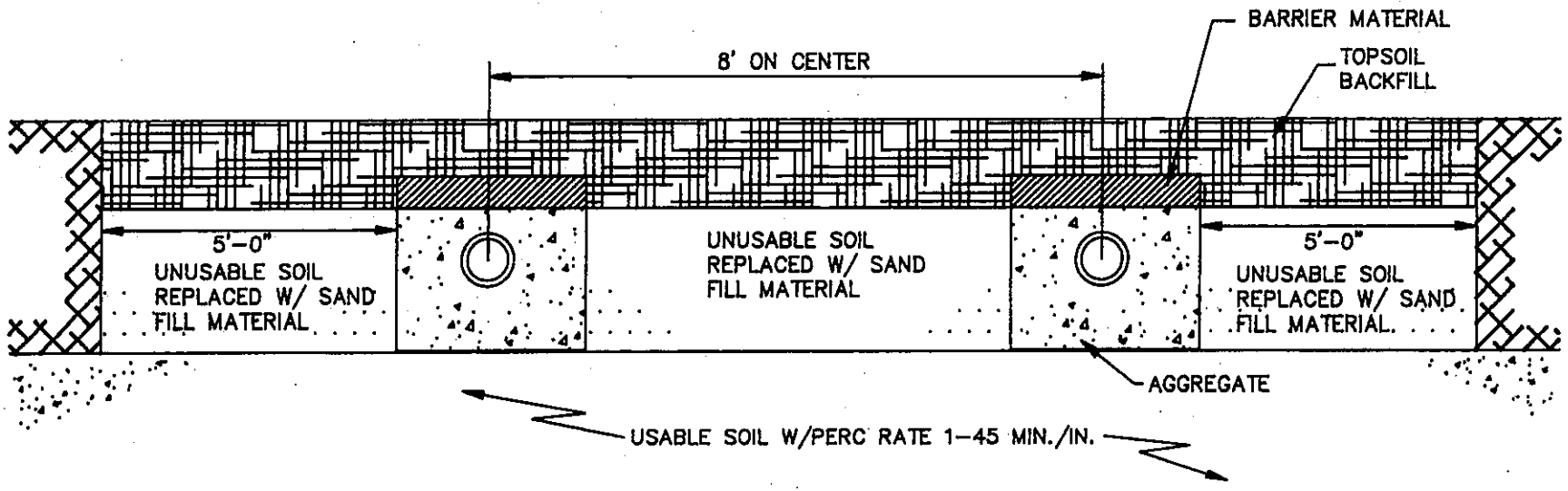


FIGURE 10

DEEP ABSORPTION TRENCH SYSTEM

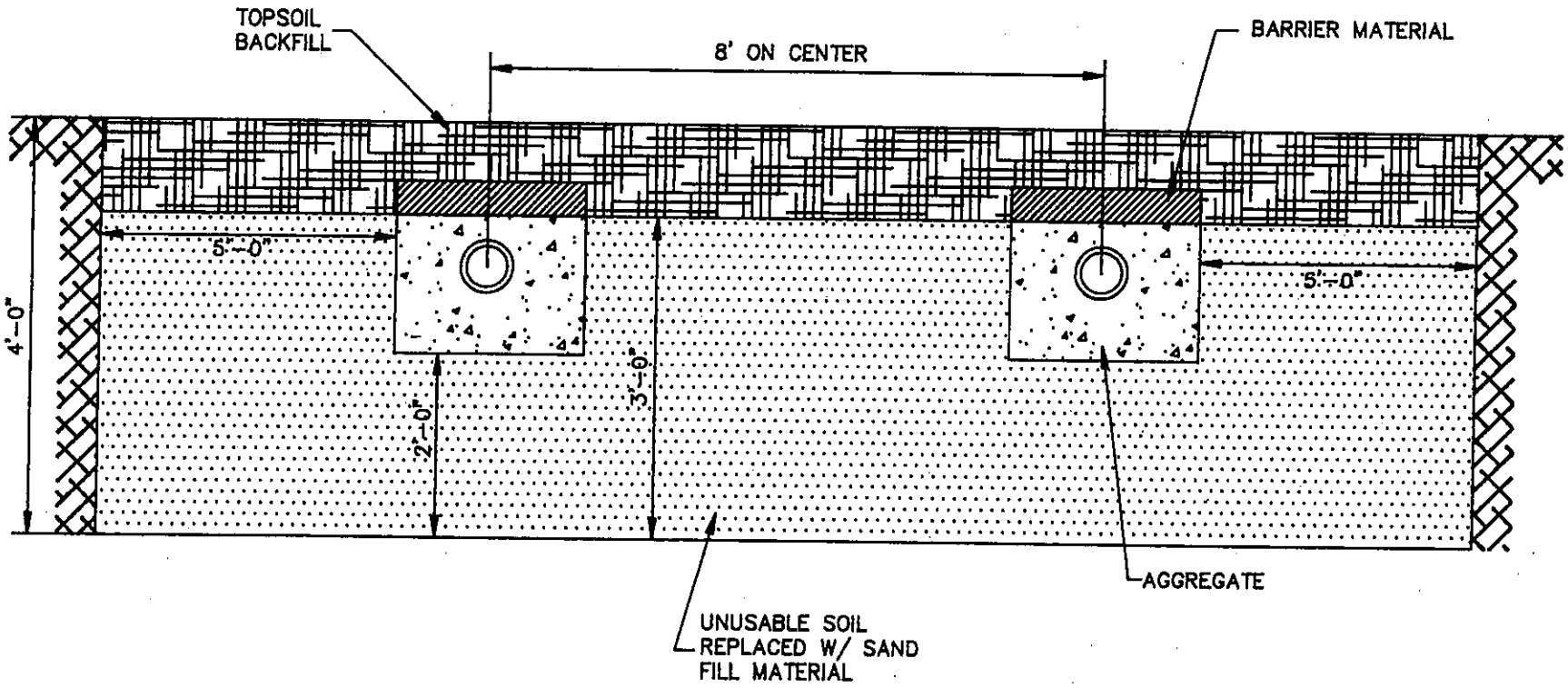
CUT & FILL SYSTEM



IMPERMEABLE SOIL SYSTEM

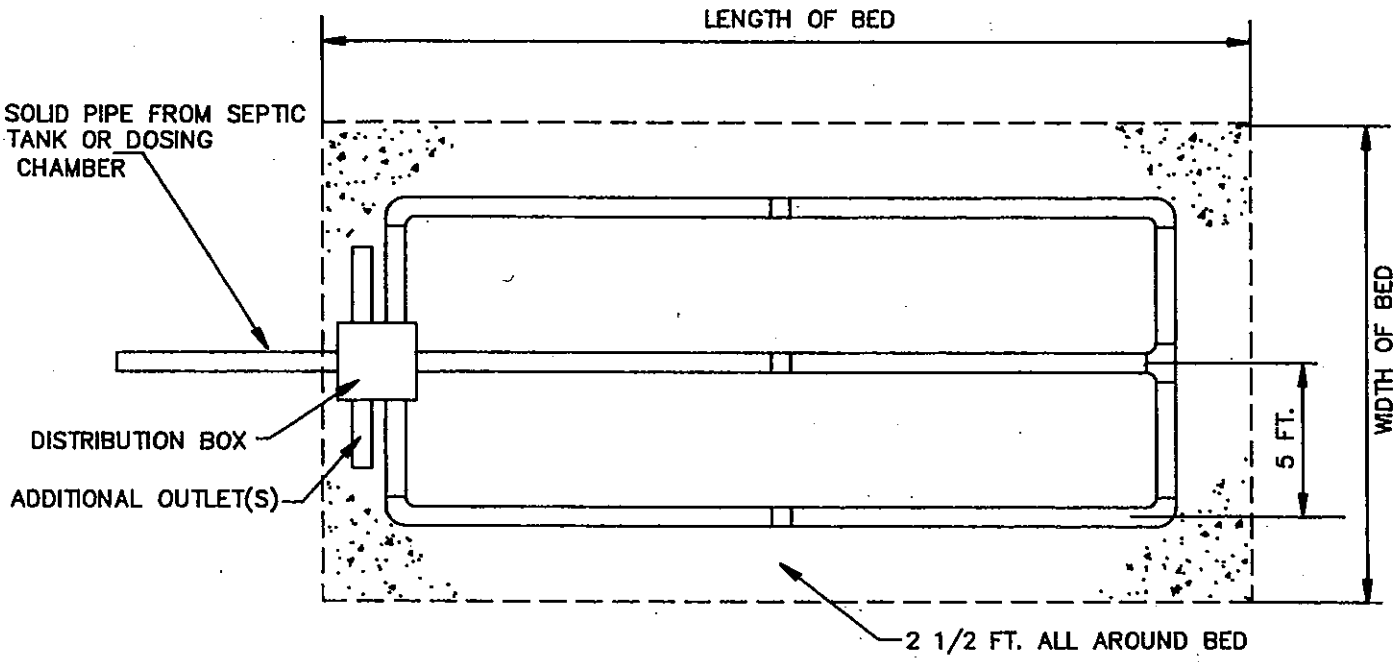
FIGURE 11

CUT & FILL SYSTEM

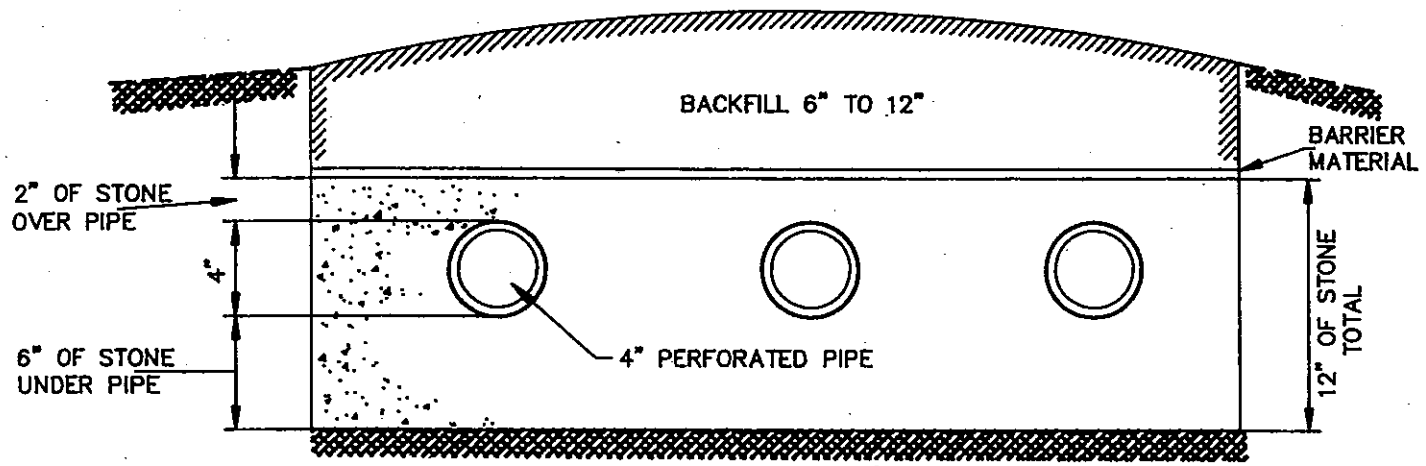


RAPIDLY PERMEABLE SOIL SYSTEM

FIGURE 12



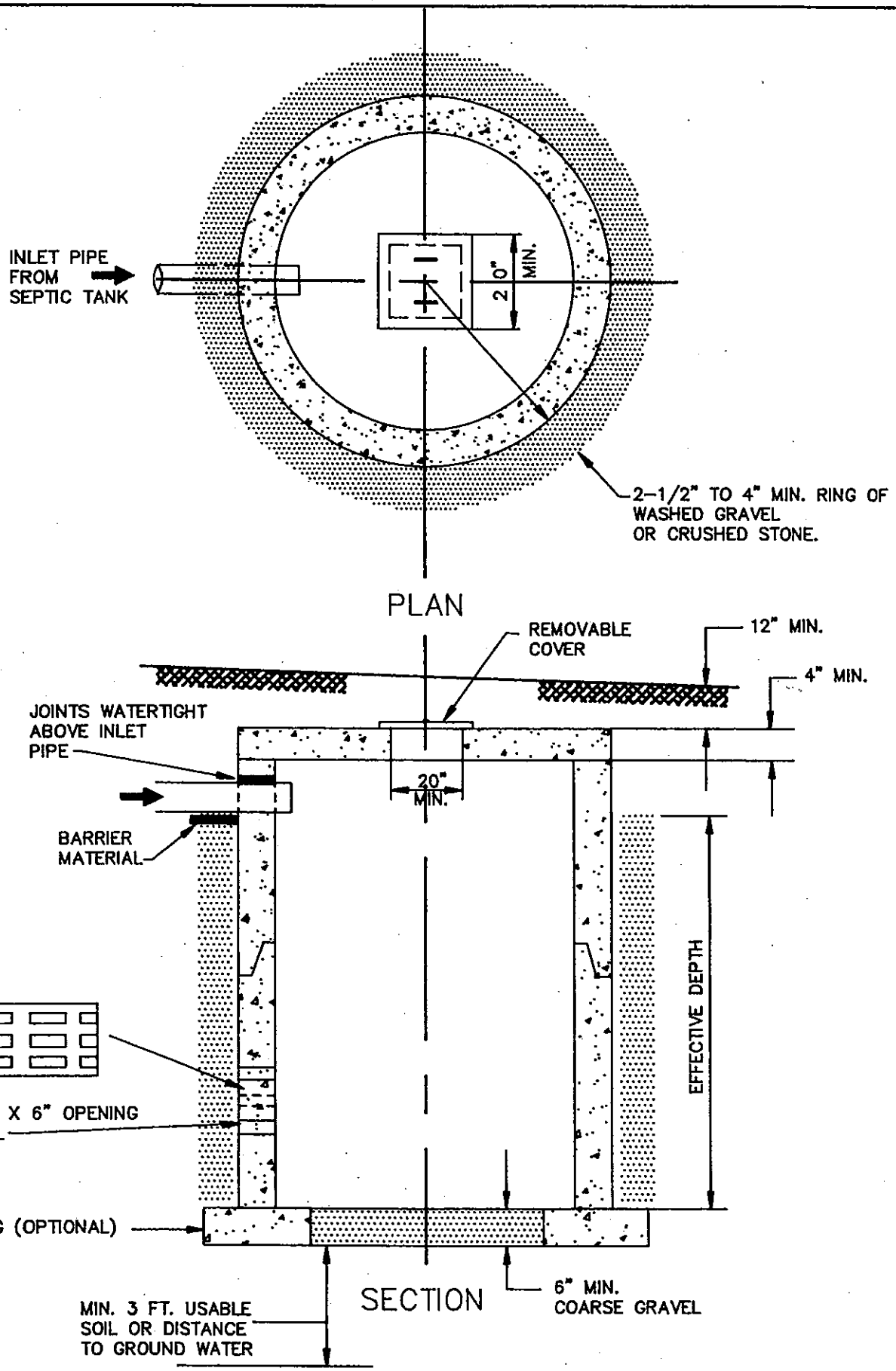
PLAN VIEW



SECTION VIEW

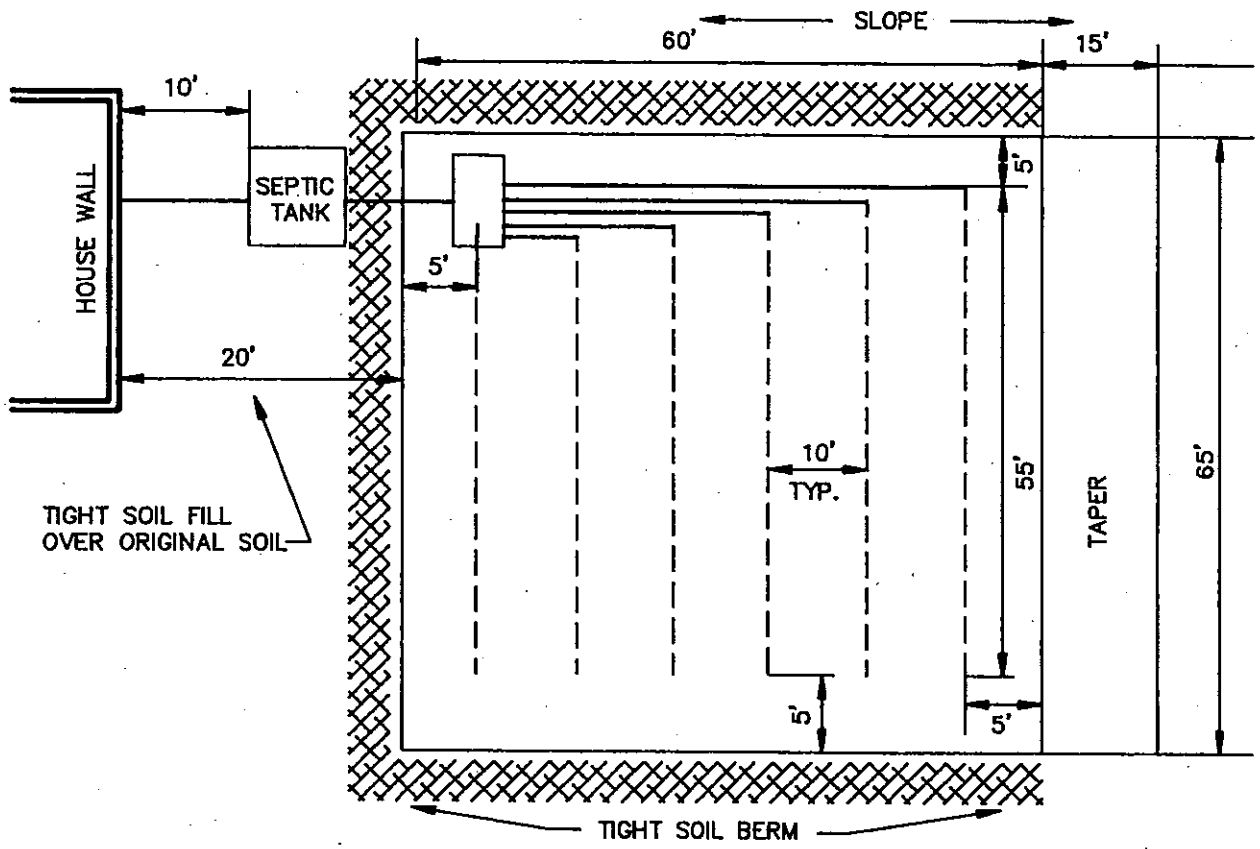
ABSORPTION BED SYSTEM

FIGURE 13



PRECAST SEEPAGE PIT DETAIL

FIGURE 14

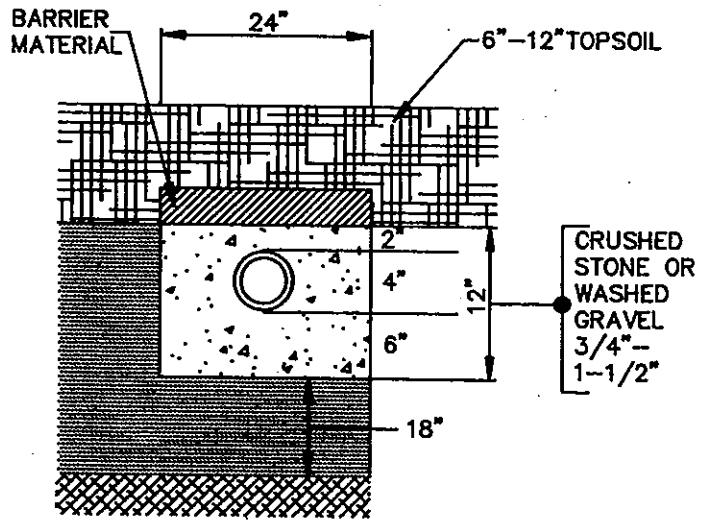


PLAN

RAISED FILL SYSTEM PLAN

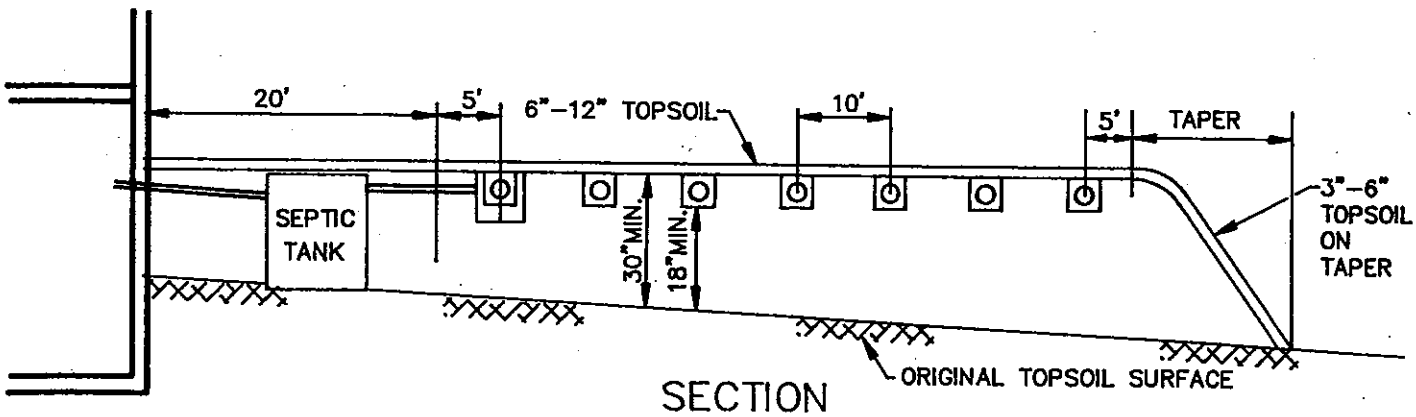
TIGHT OR MARGINAL SOILS

FIGURE 15



TRENCH DETAIL

BARRIER MATERIAL
BETWEEN THE TOPSOIL AND STONE
TRENCH.

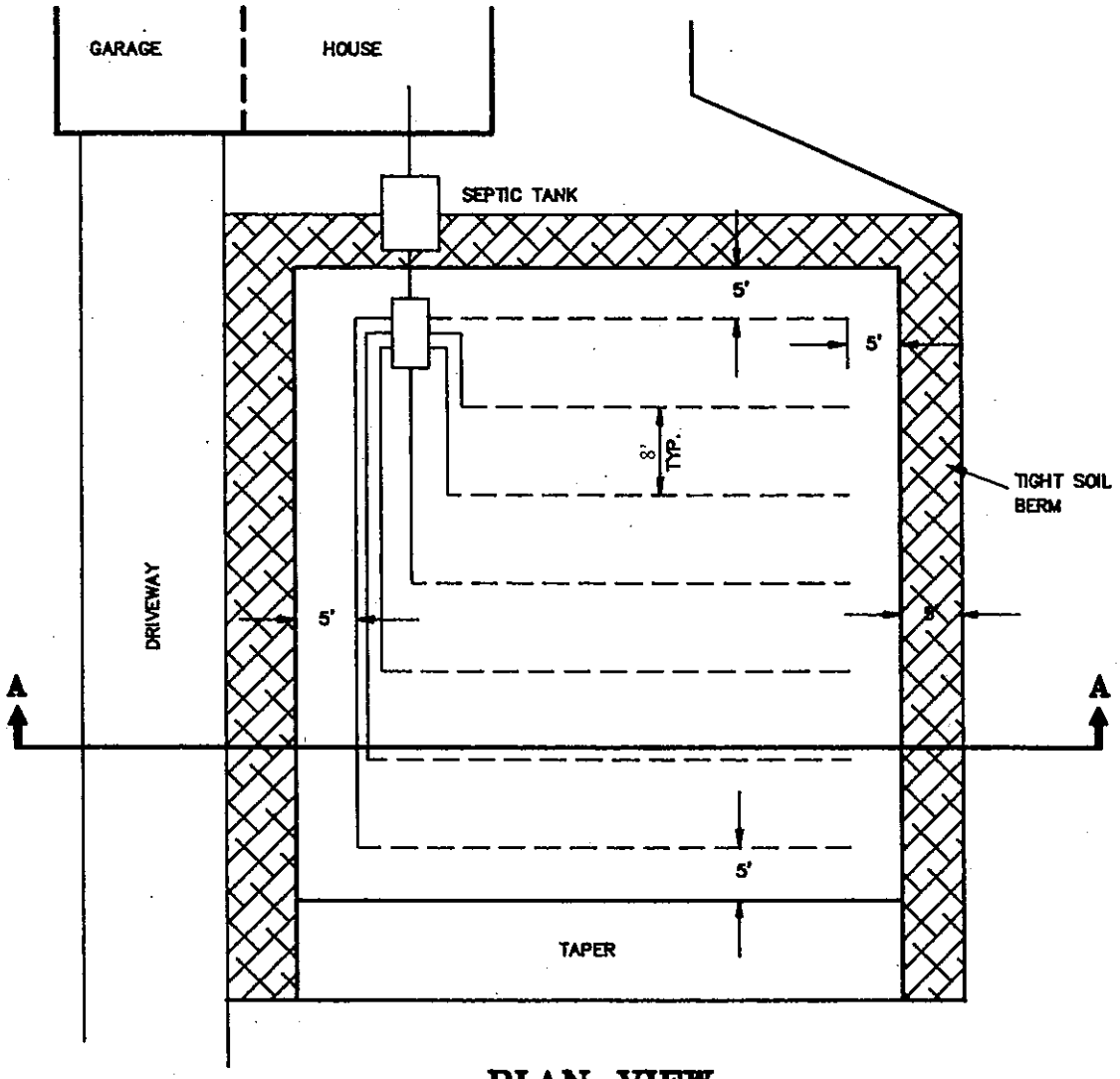


SECTION

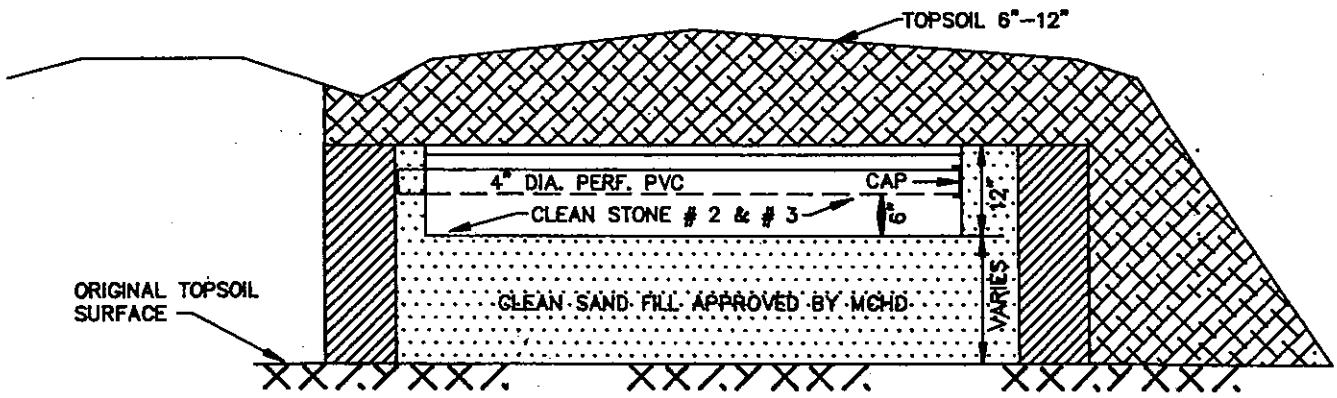
RAISED FILL SYSTEM SECTION

TIGHT OR MARGINAL SOILS

FIGURE 16



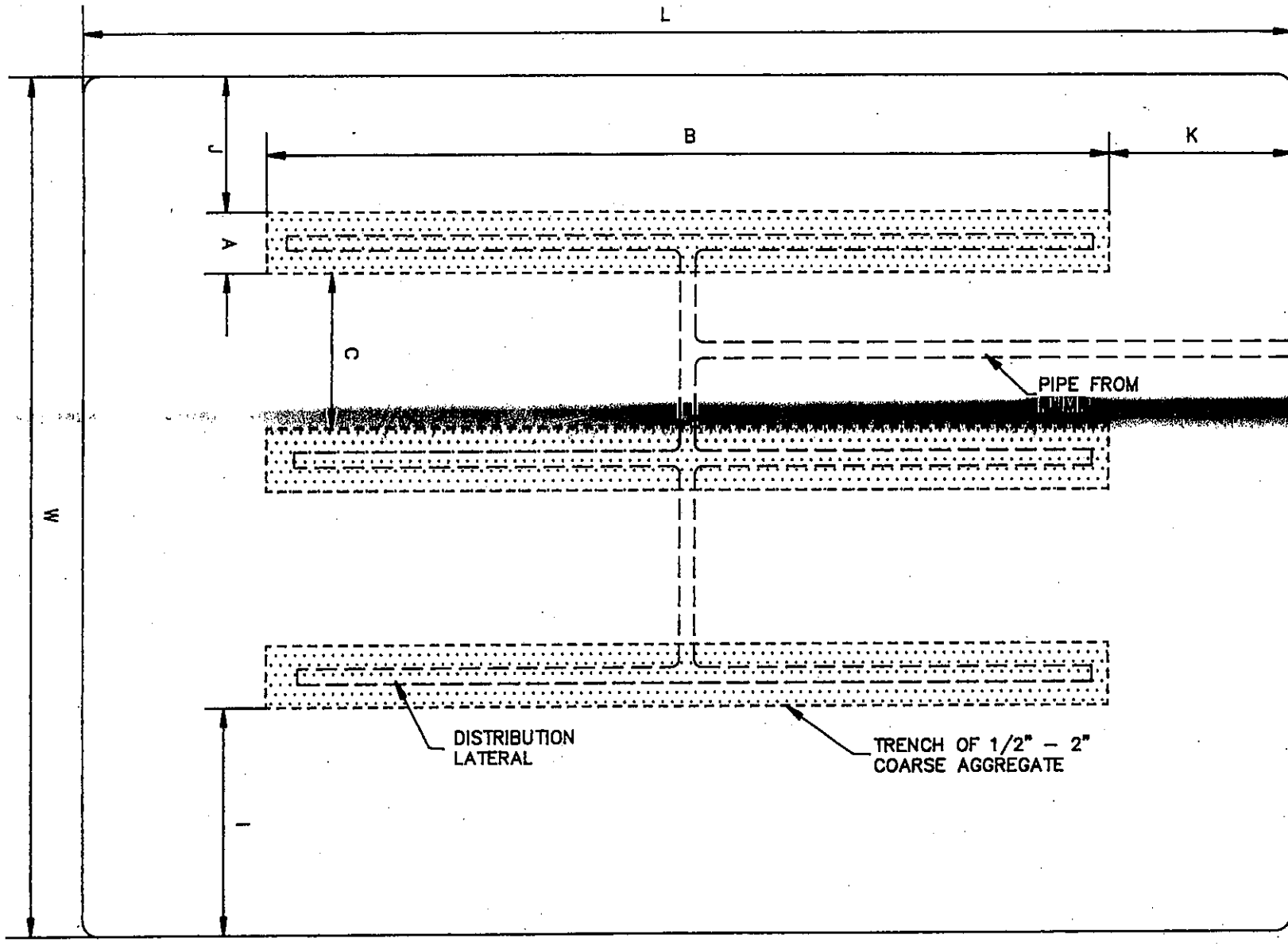
PLAN VIEW



LONGITUDINAL SECTION

MODIFIED RAISED FILL SYSTEM

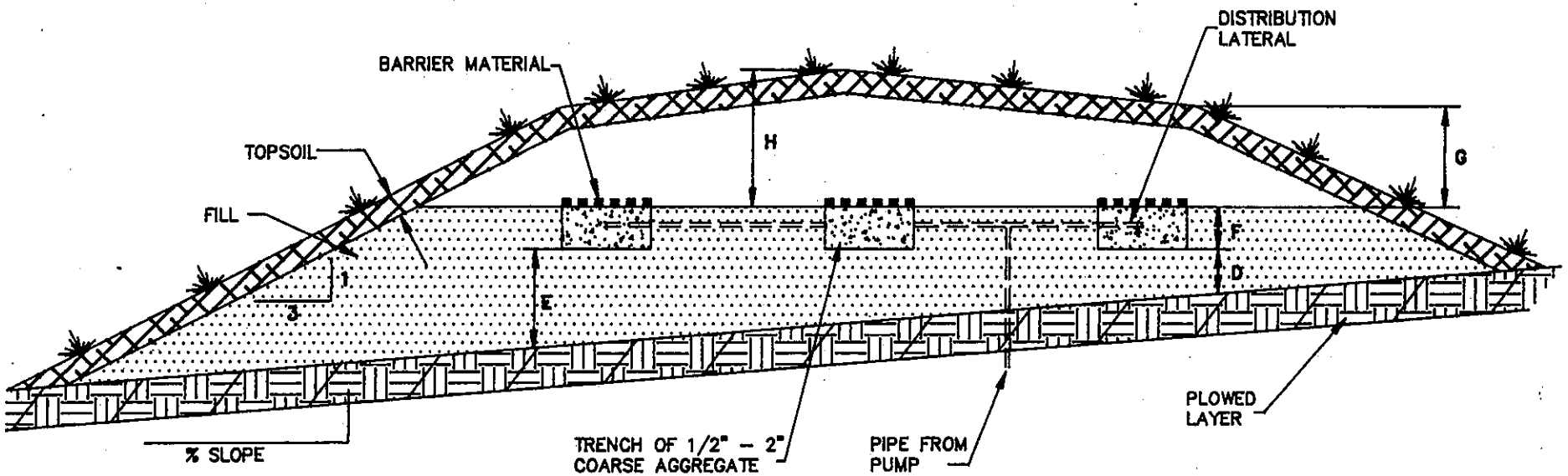
FIGURE 17



PLAN VIEW OF A MOUND SYSTEM USING THREE TRENCHES FOR THE ABSORPTION AREA.

MOUND SYSTEM – PLAN

FIGURE 18



CROSS SECTION VIEW OF A MOUND SYSTEM USING THREE TRENCHES FOR THE ABSORPTION AREA.

MOUND SYSTEM – SECTION

FIGURE 19

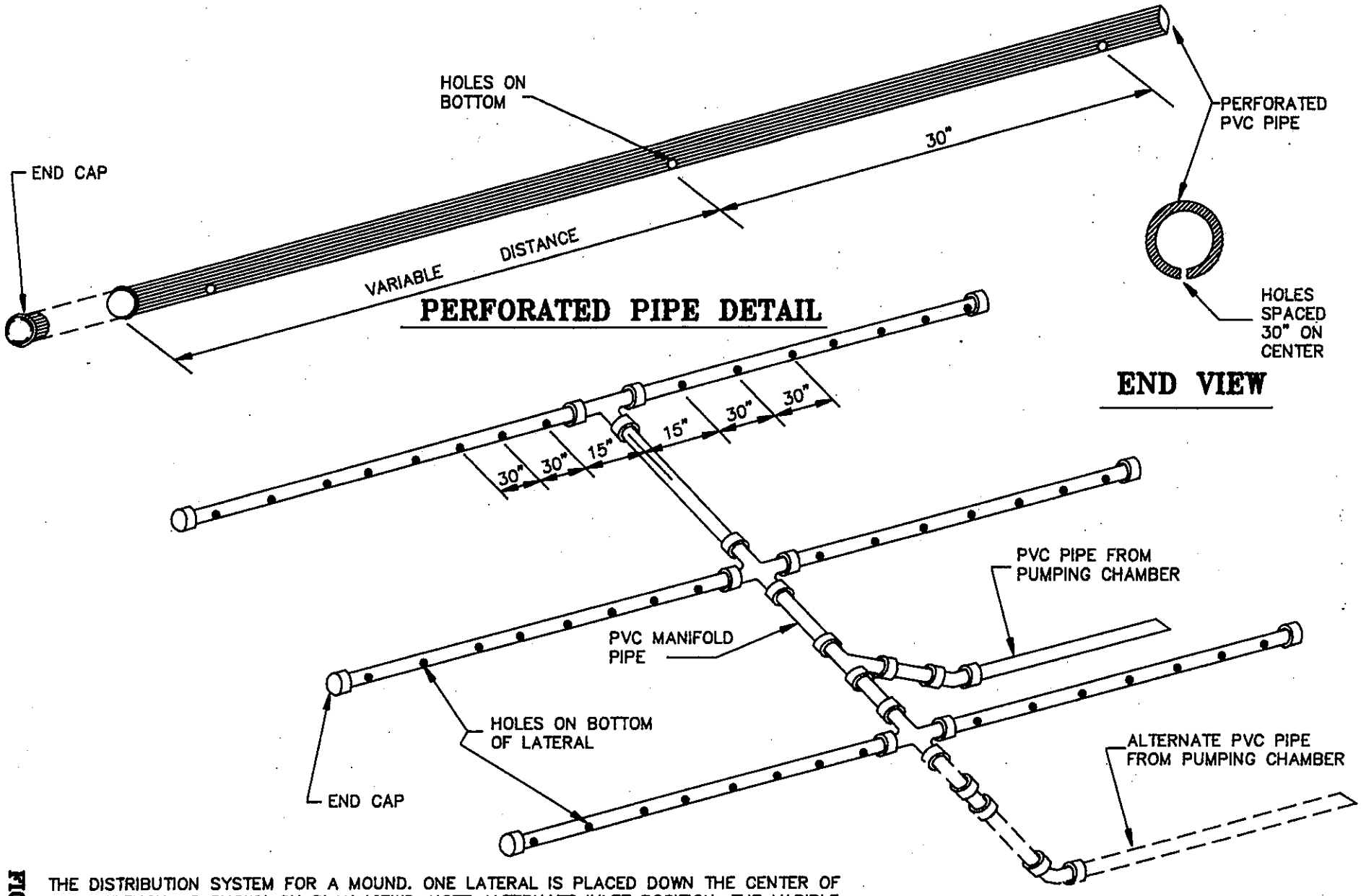
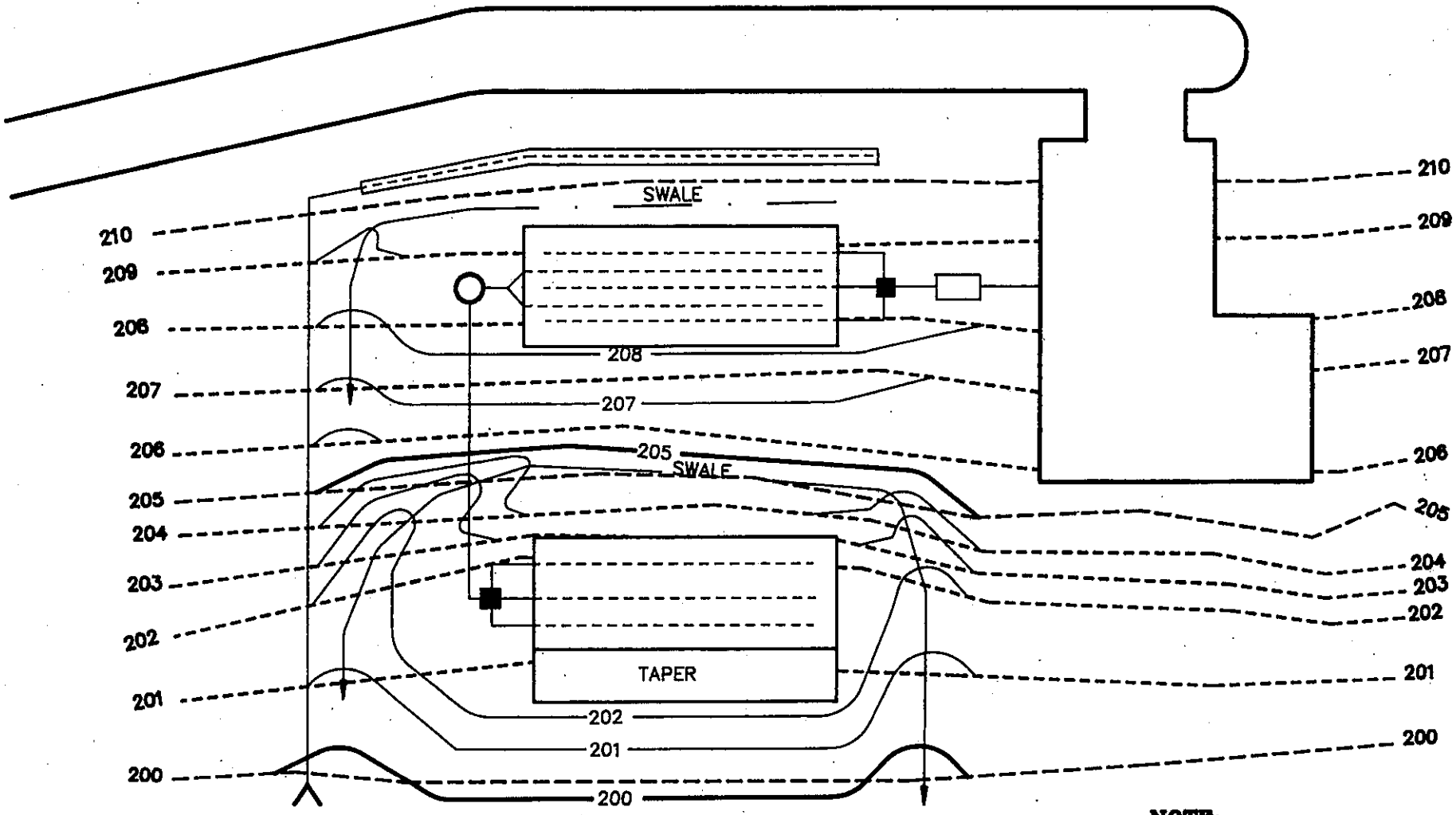


FIGURE 20

THE DISTRIBUTION SYSTEM FOR A MOUND. ONE LATERAL IS PLACED DOWN THE CENTER OF EACH TRENCH AS SHOWN ON PLAN VIEWS. NOTE ALTERNATE INLET POSITION. THE VARIBLE DISTANCE BETWEEN THE LAST HOLE AND THE NEXT TO LAST HOLE WILL RANGE BETWEEN 15 AND 30 IN., DEPENDING UPON THE LENGTH OF TRENCH. DISTRIBUTION SYSTEM MUST BE ARRANGED SO MANIFOLD AND LATERALS DRAIN AFTER EACH DOSE.

MOUND SYSTEM – PIPE LATERAL LAYOUT



CONCEPTUAL DIAGRAM

NOTE:
EACH APPLICATION WILL REQUIRE A SPECIFIC DESIGN TO FIT LOT CHARACTERISTICS ALONG WITH ELEVATION INFORMATION AND DIMENSIONS.

SAND FILTER SYSTEM

FIGURE 21

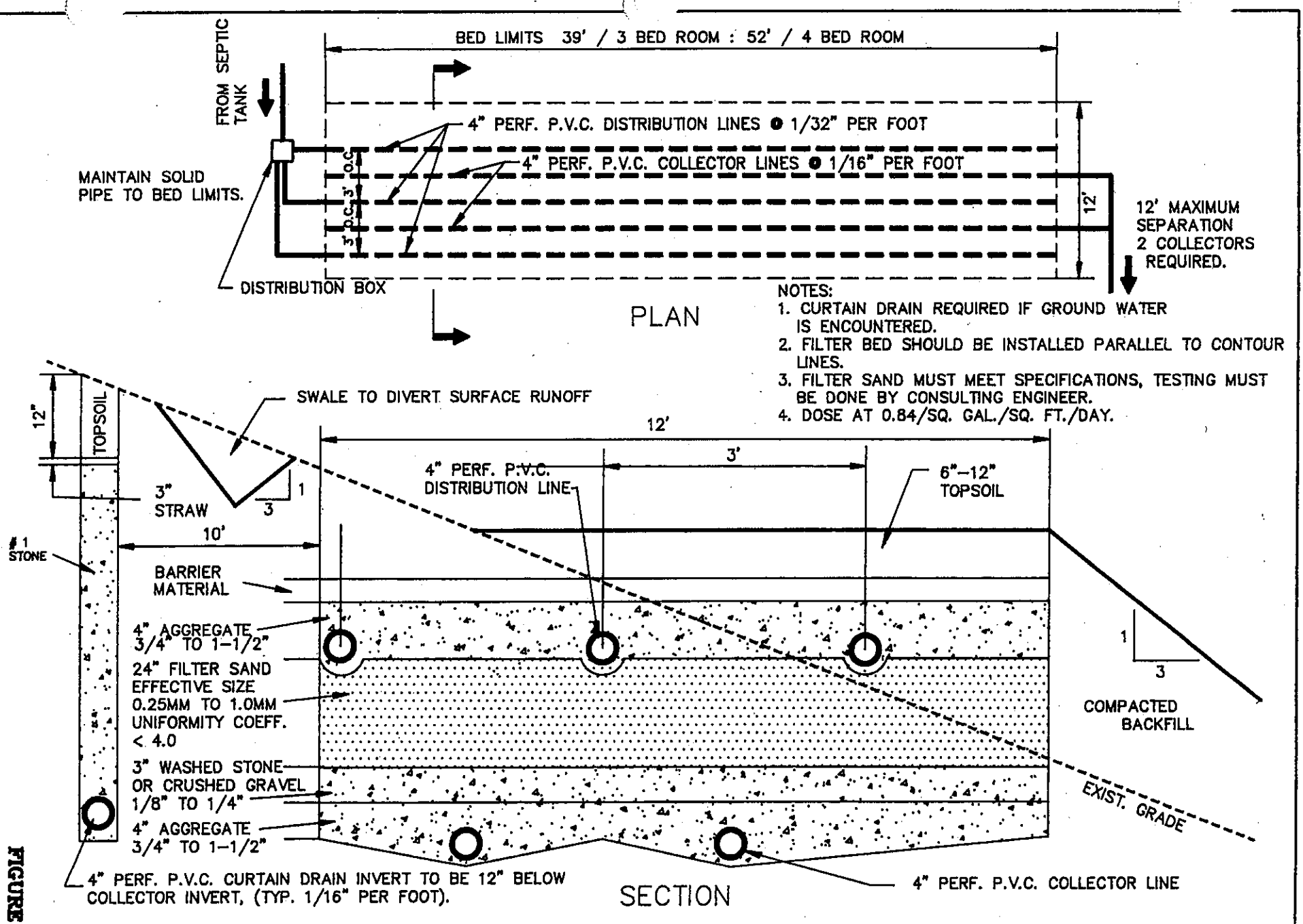
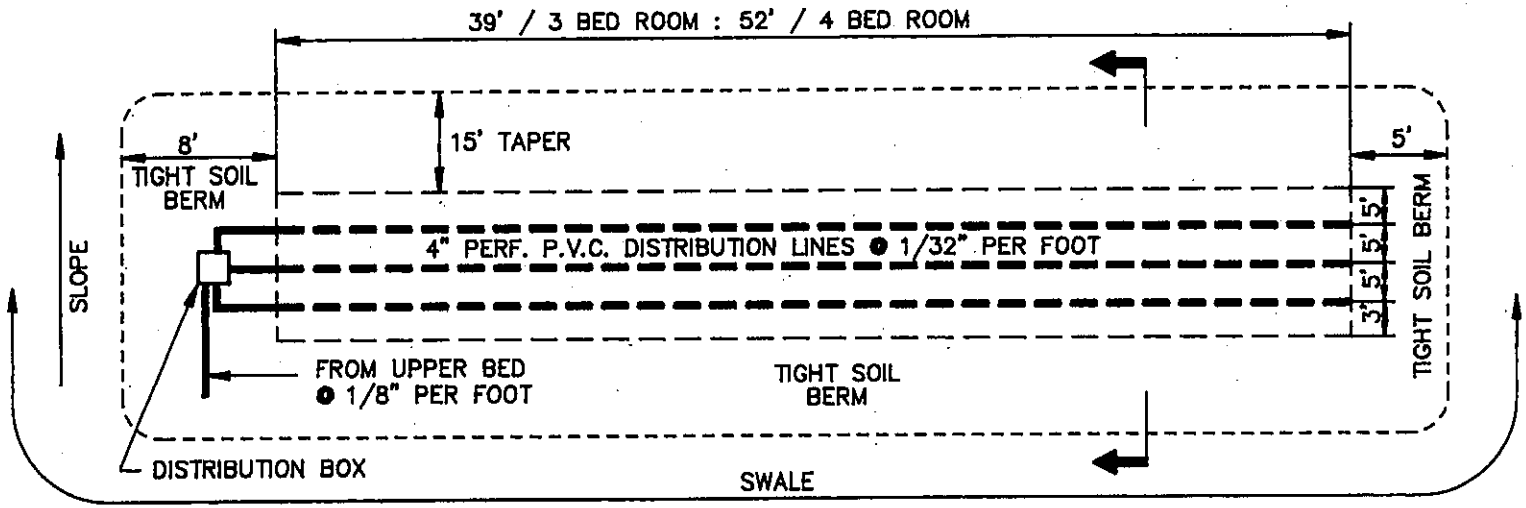
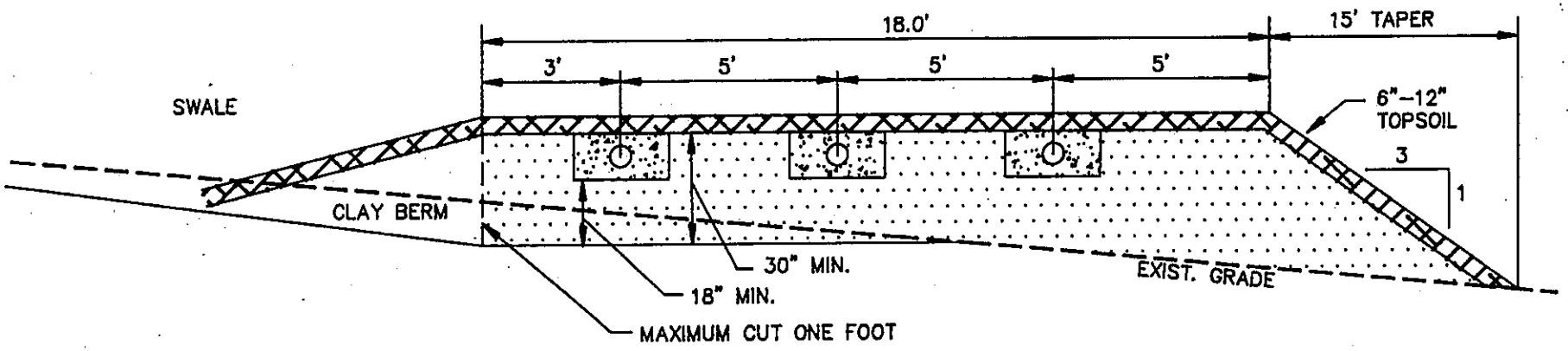


FIGURE 22

SAND FILTER SYSTEM – FIRST STAGE



PLAN



SECTION

NOTES:
1. MATERIAL IN SAND BED APPROVED BY THE MONROE COUNTY HEALTH DEPARTMENT.
2. MAINTAIN SOLID PIPE FROM DISTRIBUTION BOX TO BED LIMIT.
3. A SEPARATION OF 100 FEET IS REQUIRED BETWEEN THE SAND BED TAPER AND ANY PROPERTY LINE.

FIGURE 23

SAND FILTER SYSTEM – SECOND STAGE

APPENDIX C

ITEM 1	CHECK SHEET
ITEM 2	SAN 72 - APPLICATION FOR SANITARY FACILITIES FOR REALTY SUBDIVISIONS
ITEM 3	APPLICATION FOR WATER SUPPLY IMPROVEMENTS
ITEM 4	APPROVAL FOR WATER SUPPLY IMPROVEMENTS
ITEM 5	APPLICATION FOR CONSTRUCTION PERMIT FOR INSTALLATION OR REPAIR OF AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM
ITEM 6	CONSTRUCTION PERMIT FOR INSTALLATION OR REPAIR
ITEM 7	REFERRAL FORM
ITEM 8	PROCEDURES FOR RAISED SAND FILL SYSTEM TESTING AND INSPECTIONS
ITEM 9	PROPERTY TRANSFER INSPECTION RECOMMENDATIONS

MONROE COUNTY DEPARTMENT OF PUBLIC HEALTH
BUREAU OF PUBLIC HEALTH ENGINEERING

Review of Plans: For Developments with Individual Sewage Disposal Systems
Reference: Monroe County – Individual Sewage Disposal Design Manual – July 1992

Name of Development_____ Town_____
MCHD Representative Date of
Witnessing Field Tests _____ Field Tests _____
Reviewed by:_____ Health Dept. _____ Date _____
Submitting Firm _____ Phone _____ Date _____
Check below if satisfactory or adequate – Circle in red unsatisfactory or incomplete items.

ITEM	ENGRS. CHECK	COUNTY CHECK	REMARKS
GENERAL			
1. Correct Review fee received			
2. Field Testing paid			
3. Prepared by Licensed Engineer or Surveyor (stamp and signature on plan)			
4. Engineer's Report (for commercial development)			
5. Space for approval (3" X 6" in size, correct phone numbers)			
6. State, County & Local Government Reviews & approvals			
a. County Planning Review – DRC (if required)			
b. Town Planning Board preliminary approval			
c. Town Engineer review (signature on plans/letter)			
d. SEQR Determination:_____			
e. Env. Con. Law, Article 15-Relocation/Alteration Streams, Bed or Banks, Class C(T) or higher			
d. Env. Con. Law Article 24 Freshwater Wetlands Determination made or permit received			
f. Env. Con. Law Article 17 SPDES Permit			
1. Uniform Procedures Fee			
2. Copy of San. 72 for State			
3. SPDES Application Form D			
4. Copy USGS Map for State			
7. Contours shown (2 ft. intervals)			
8. Water courses, swamps, rock outcrops, filled areas shown			
9. Final Grade indicated			
a. Elev. Hwy. Center line			
b. Elev. Hwy. R.O.W. line			
c. All elevations, USGS datum and benchmark provided			
10. Location sketch on plans			
FORM SAN 72 OR COMMERCIAL APPLICATION			
11. Signature (Engineer and Developer)			
12. All items completed			

ITEM	ENGRS. CHECK	COUNTY CHECK	REMARKS
PUBLIC WATER SUPPLY			
13. Form DOH 348 signed by applicant			
a. Water letter or signature on plans			
b. Town Engineer's approval (if necessary)			
c. Water Supt. Or Comm. Of Public Works approval			
d. WSA decision granted or cancellation notice			
e. NYSHD approval of distribution system			
14. Size and location of existing water mains			
15. Size and location of proposed water mains			
16. All lots served			
a. Size and location of house service shown			
b. Size and proposed water services sufficient (hydraulic analysis)			
17. Dead end mains eliminated (loops, blowoffs, hydrants)			
18. Water disinfection note on plans			
19. Disinfection and sampling points indicated			
PRIVATE WATER SUPPLY			
20. Location of well on typical lot layout			
21. Location of well on each lot indicated			
22. Location of wells within 500 ft. on adjoining property indicated			
23. Distance from house			
24. Distance from property lines (15 ft.)			
25. Distance from septic tank (50 ft. min.)			
26. Location and distance from seepage system (100 ft. min), 200 ft. min. if downgradient.			
27. Location and distance from sewage disposal system on adjoining property (100 ft. min.), 200 ft. min. if downgradient			
28. Cross section of well			
29. Protection details (sanitary seal, etc.)			
30. Results of test wells or samples from nearby wells			
PRIVATE SEWAGE DISPOSAL			
31. Location and results of soil percolation tests (three percs and one deep hole per lot)			
32. Locations and logs of soil strata and ground water for soil borings or deep holes			
a. Soil tests witnessed by Health Department			
33. Schedule of sizes of septic tanks and seepage systems for 2, 3, & 4 bedrooms			
34. Cellar drainage disposal method and location shown on plans			
35. Separate pumps for laundry waste and cellar infiltration indicated by note & shown on layout			
36. Size, material, slope, tight joints for effluent line			
37. Size, material, slope, tight joints for raw sewage line			
38. Separation between water service and sewage disposal (10 ft. min.)			

ITEM	ENGRS. CHECK	COUNTY CHECK	REMARKS
39. Typical layout to scale & scale indicated			
40. Sewage disposal system piping under driveway sleeved			
41. All elevations of system shown (house wall, tank, distribution box, absorption lateral inverts, base & top of bed)			
42. Unnecessary bends eliminated			
43. No cut or fill in leach field area noted on plans			
44. Series distribution (drop boxes) used if needed			
45. Future sewer connection with cleanout: profile & plan			
DISTRIBUTION BOX			
46. Details and dimensions			
47. Baffle – water baffle acceptable			
48. Inlet above outlets (2" min. diff.)			
SEPTIC TANK			
49. Distance from house (10' min.)			
50. Longitudinal cross-section and plan view of tank			
51. Capacity below invert of outlet (1,250 gals for three bedrooms, 250 gallons for each additional bedroom)			
52. Sanitary tee or baffles (Gas baffles)			
53. 2" – 3" drop between inverts of inlet and outlet			
54. Note regarding bury depth >12" use risers			
TILE FIELD			
55. Size, material, slope of lateral (4" diam. 1/16"/ft.)			
56. Cross-section of lateral trench			
57. Longitudinal section of lateral trench			
58. Lateral trenches equal length-show length of trench 60 ft. maximum, 75' drop box, 100' pumping			
59. Width and depth of lateral trenches (width 24" and depth 18"-24")			
60. Separation between trenches (8' o.c.)			
61. Distance from property line (10 ft. min.)			
62. Distance from existing wells (100 ft. min. and off drainage line)			
63. Number of bedrooms indicated			
64. Absorption area (total and per bedroom)			
65. 50% reserve area available for expansion			
66. Safe distance to water courses, edges of bank or fill (20 ft. to storm drain pipe, 100 ft. to high water elevation of open ditch, body of water or edge of bank)			
67. Depth to bedrock			

ITEM	ENGRS. CHECK	COUNTY CHECK	REMARKS
68. Depth to ground water or mineral deposits from start/end of each lateral			
69. Leach lines and taper parallel contours			
70. Fill (tight soil) systems - depth, size, 100' separation, trenches 10' o/c.			
71. Distance from house (20 ft. min.)			
SEEPAGE PIT			
72. Not to be used in conjunction with private wells, discouraged for all new developments			
73. Absorption area (total and per bedroom)			
74. Distance from house (20 ft. min.)			
75. Distance from property line (10 ft. min.)			
76. Distance between pits = 3 x dia.			
77. Stone size			
78. Gravel collar (6" min.)			
79. Max. ground water level 3 ft. below bottom of pit			
DRAINAGE			
80. Easements for storm drains, ditches, etc.			
81. Easements and ditches to running stream (show elevations of all drainage swales)			
82 Low areas properly drained of fill			
83. Sedimentation and erosion control provided			
a. Town maintenance of drainage system			
84. Disturbed area (Ac.)			

Monroe County Health Department
PO Box 92832
Application For Approval of Sanitary Facilities
For Realty Subdivisions

NOTE: (Law requires that no subdivision or portion hereof shall be sold, leased or rented or any permanent building erected thereon until plans are approved by the Monroe County Department of Health).

Application is hereby made for the approval of plans for a realty subdivision as required by the provisions of Article III of the Monroe County Sanitary Code.

GENERAL INFORMATION

1. Name of Subdivision _____ Location (Village or Town) _____
2. Owner (Name of Person, Company, Corporation or Association owning the Subdivision) _____
3. Business Address (Street, City) _____
4. Officers (If organized, give names of officers) _____
5. Total area of entire property _____ Area of this section _____
   Total number of lots _____ Number of lots in this section _____
   Have plans for previous sections been approved? _____ Disapproved? _____
   Will plans for additional sections be submitted? _____
6. Do you intend to build houses on this subdivision? _____ Do you intend to sell lots? _____
   Do you intend to build on some lots and sell others without buildings? _____
7. Is this subdivision or any part thereof in an area under the control of local planning, zoning or other officials? _____
   If so, have plans been submitted to such authorities? _____
   Have these plans been approved or disapproved by such governing authority? _____
8. Nature of soil (Describe to a depth of 10 feet, 20 feet if seepage pits are proposed, giving thickness of various strata such as topsoil, clay, loam, sand, etc.) _____ Date Determined _____
   By whom determined _____ How determined _____
9. Topography (flat, rolling, gentle or steep slope, etc.) _____
10. Grading (State depth of maximum cut) _____ Maximum fill _____
11. Depth to water table - Max. _____ Min. _____ Date determined _____
    By whom determined? _____ How determined? _____

WATER SERVICE

12. Proposed method of supplying water (If public, give name of municipality, water district or company) _____
    _____ Has municipality, district or company agreed to supply water? _____
13. State approximate distance to nearest public water supply main of municipal system _____
14. State approximate distance to nearest subsurface sewage disposal system _____
15. If a water supply application is required, has the approval from DEC Bureau of Water Regulation been received? _____

SEWERAGE SERVICE

16. Proposed method of collection and disposal of sewage (Give name of municipality or sewer district if public sewers are to be used) _____ Service approved? _____
17. State approximate distance to nearest public sewer main of municipal system _____ Give name of municipality or sewer district _____
18. State approximate distance to nearest well water supply _____

?AINAGE

'. Are there any low or wet areas that require drainage? _____ Are there any watercourses, ditches or ravines which may be filled in? _____ Is there an existing local drainage plan? _____ Have these plans been approved by drainage officials? _____ State arrangements for disposing of surface water from streets and other areas _____

GAS TRANSMISSION LINES

20. Does a high pressure gas transmission line pass through or within 300 feet of any lot in this subdivision? _____
If so, has its location been accurately shown on the plans? _____

ADDITIONAL INFORMATION

21. Maximum number of bedrooms in completed house _____ Bedrooms in expansion attic _____
22. Cellar drainage: Are cellar or footing drains to be installed? _____ If so, show on plans how waste will be disposed of.
23. Laundry wastes: Are laundry tubs to be located in basement? _____ If so, show on plans how waste will be disposed of.

It is hereby agreed that if the attached plans dated _____, or any amendment of revision thereof are approved by the Monroe County Department of Health, installation of water supply and sewage disposal facilities will be made in accordance with the details thereof as shown on the approved plans. If the subdivided lands, shown on such plans are sold before such installations are made, it is agreed that all purchasers of lots will be furnished with a legible reproduction of the approved plans and they will be notified of the necessity of making such installations in accordance with such approved plans.

Date _____ Signature _____

Official Title _____

The Statement must be signed by the owner of the land platted for subdivision or the responsible official of the company or corporation offering the same for sale.

TO BE FILLED IN BY THE PROFESSIONAL ENGINEER OR LAND SURVEYOR*

The plans submitted with this application were prepared by me or under my supervision and direction. Individual water and sewerage systems, if shown on the plans, were designed after careful and thorough study of local geological and existing sanitary conditions.

Name (Give Firm, if any) _____

Address _____

License and Number _____ Signature _____

* Land Surveyor only if granted exception under Section 7208n of the State Education Law

IMPORTANT NOTES

(1) The plans shall show all information required by the State Health Department Bulletin Planning the Subdivision as Part of the Total Environment and such other information as may be required because of special local features or conditions.
(2) Plans must be prepared so as to be completely legible and to permit satisfactory reproduction by microfilming processes.
(3) One white print (either on paper or cloth) shall be submitted for filing with the Department of approved, together with such other tracings or prints as may be required for filing with the County Clerk and the subdivision owner.
(4) A LOCATION DIAGRAM (scale about 1"=3000') showing the situation of the subdivision with respect to main roads, prominent streams, etc., shall be included on the plans.
(5) A KEY MAP (scale about 1"=400') shall be shown on the plans if there are several Sections of the subdivision, outlining the relative location of the subject Section with respect to the rest of the subdivision.
(6) Inasmuch as the stamp of approval must be placed on face of signs, a space 3" x 6" should be reserved for this purpose.

5835-10-8201-92
-72, MCHD VERSION

NEW YORK STATE DEPARTMENT OF HEALTH
APPLICATION FOR APPROVAL OF PLANS
PUBLIC WATER SUPPLY IMPROVEMENT

1. Applicant	2. Location of Works	3. County	4. Water District

5. Type of Ownership:

__ Municipal __ Commercial __ 8 Private-Other __ 1 Authority __ 30 Interstate
__ Industrial __ 9 Water Works Corp. __ Private-Institutional __ 19 Federal __ 40 International
__ 26 Board of Education __ 20 State __ 18 Indian Reservation

6. Is project related to a concurrent Water Resources Commission application? __ Yes __ No If yes, give number _____

7. Drainage Basin

8. Nature of Project:
__ New Works
__ Modifications

9. Is Federal Aid Involved?
__ 1 Yes __ 2 No

10. Is Project related to a Comprehensive Water Study?
__ 1 Yes __ 2 No

11. Type of Project:
__ 1 Source __ 3 Pumping Units __ 5 Fluoridation __ 7 Distribution __ 9 Other
__ 2 Transmission __ 4 Chlorination __ 6 Other Treatment __ 8 Storage

REMARKS:

12. Estimated Cost of Project:
Source $ _____ Treatment $ _____ Distribution $ _____

13. Population:
Total Population of service area: _____ % Population actually served: _____ % Population served affected by project: _____

14. Latest Total Consumption Data (in MGD)

Average Day _____ Year _____
Maximum Day _____ Year _____
Peak Hour _____ Year _____

15. Approved Plans are to be returned to:

___ Engineer
___ Applicant

16. Name of Design Engineer _____ N.Y. State License No. _____

Address _____ Telephone No. _____

17. Name and Title of Applicant or Designated Representative _____

Mailing Address _____

_____ _____
Date Signature of Applicant

NOTE: All applications must be accompanied by plans, specifications and an Engineer's Report describing the project in detail. The project must first be discussed with the appropriate City, County, District or Regional Public Health Engineer. Signature by a designated representative must be accompanied by a letter of authorization.

NEW YORK STATE DEPARTMENT OF HEALTH
APPROVAL OF PLANS
PUBLIC WATER SUPPLY IMPROVEMENT

This approval is issued under the provisions of 10 NYCRR, Part 5:

1. Applicant	2. Location of Works	3. County	4. Water District

5. Type of Project:

__ 1 Source
__ 2 Transmission
__ 3 Pumping Units
__ 4 Chlorination
__ 5 Flouridation
__ 6 Other Treatment
__ 7 Distribution
__ 8 Storage
__ 9 Other

DESCRIPTION OF PROJECT:

By initiating improvement of the approved supply, the applicant accepts and agrees to abide by and conform with the following:

a. THAT the proposed works be constructed in complete conformity with the plans and specifications approved this day or approved amendments thereto.

b. THAT the proposed works not be placed into operation until such time as Completed Works Approval is issued in accordance with Part 5, of the New York State Sanitary Code.

c. THAT the water main shall be disinfected equal to AWWA Standard Specifications for Disinfecting Water Mains, Designation C651 (latest revision), using the continuous feed method. Following flushing, samples of the water shall be collected from the main and from each branch. Fire hydrants are not acceptable sampling points. Water samples shall be collected by the Monroe County Health Department and the main shall not be placed in service until the water has been approved and notification thereof received.

d. THAT when installing fire hydrants, should ground water be encountered within seven (7) feet of the finished grade, fire hydrant weep holes (drains) shall be plugged.

e. THAT this certificate is granted with the understanding that the approved plans are subject to review and reapproval after two years from date of approval, if installation is not completed by that time.

f. THAT adequate erosion control measures shall be employed during all phases of construction.

ISSUED FOR THE STATE COMMISSIONER OF HEALTH

DATE: _____ BY: _____

xc: NYSDH, Albany
NYSDOH, Rochester Office

GENERAL

6. Type of Ownership:
__ Municipal __ Commercial __ 8 Private-Other __ 1 Authority __ 30 Interstate
__ Industrial __ 9 Water Works Corp. __ Private-Institutional __ 19 Federal __ 40 International
__ 26 Board of Education __ 20 State __ 18 Indian Reservation

7. Estimated Total Cost	8. Population Served	9.Drainage Basin

10.Federal Aid Involved? __ 1 Yes __ 2 No

11. WSA Project? __ 1 Yes __ 2 No

SOURCE

12. __ Surface Name _____ Class _____
__ Ground Name _____ Class _____

13. Est. Source Development Cost

14. Safe Yield in GPD:

15. Description:

TREATMENT

16. Type of Treatment
__ 1 Aeration __ 5 Clarification __ 9 Fluoridation
__ 2 Microstrainers __ 6 Filtration __ 10 Softening
__ 3 Mixers __ 7 Iron Removal __ 11 Corrosion Control
__ 4 Sedimentation __ 8 Chlorination __ 12 Other

17. Name of Treatment Works	18. Maximum Treatment Capacity in GPD	19. Grade of Plant Operator Required	20. Est. Cost

DESCRIPTION:

DISTRIBUTION

22. Type of Project
__ 1 Cross Connection __ 3 Transmission
__ 2 Interconnection __ 4 Fire Pump Cl_2

23. Type of Storage
Elevated _____ Gals.
Underground _____ Gals.

24. Est. Distribution Cost

25. Anticipated Distribution
System Demand: Avg._____ GPD Max _____ GPD

26. Designed for fire flow?
__ 1 Yes __ 2 No

DESCRIPTION:

New Building_____
Repair-Alteration_____

MONROE COUNTY DEPARTMENT OF PUBLIC HEALTH

BUREAU OF PUBLIC HEALTH ENGINEERING

CONSTRUCTION PERMIT

FOR THE INSTALLATION OR REPAIR OF AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Name of Owner_____Town_____

Road_____

Draw a plot plan, in ink, give size of lot and show location of house, septic tank, Leaching system and well. Give distances between well and septic tank, well and leaching system, Leaching system and property lines. Location of wells and sewage disposal on neighboring lots should be determined and distances to them shown.

Call the Monroe County Department of Public Health at 753-5060, for inspection of each sewage disposal system before backfilling is done. This form may also be faxed to 753-5098.

NOTE: APPROVAL GRANTED WITH THE UNDERSTANDING THAT SAID PLANS ARE SUBJECT TO REVIEW AND REAPPROVAL AFTER TWO YEARS FROM DATE HEREON, IF INSTALLATION IS NOT COMPLETED BY THAT TIME.

Number of bedrooms_____ Size of Septic Tank_____

Soil absorption test result was_____minutes

Width of Trench_____inches Depth of Trench_____inches

Total amount of leach_____feet Length of each line_____feet

This permit may be revoked if field conditions are found to differ from information submitted on the application or plan.

The proposed arrangements for sewage disposal for the above named property have been reviewed and found to meet the requirements of the Monroe County Department of Health. This permit is issued provisions of Article IIA of the Monroe County Sanitary Code.

DATE:_____

NAME:_____

TITLE:_____

New Building _____
Repair-Alteration _____

MONROE COUNTY DEPARTMENT OF PUBLIC HEALTH

BUREAU OF PUBLIC HEALTH ENGINEERING
APPLICATION FOR A CONSTRUCTION PERMIT
FOR THE INSTALLATION OR REPAIR OF
AN INDIVIDUAL SEWAGE DISPOSAL SYSTEM

Name of Owner _____ Date _____

Present Mailing Address _____ Phone _____

City-Town-Village _____ Zip Code _____

Type of Building _____

Number of Bedrooms _____ Expansion Attic _____

Detailed Location of Building Lot _____

_____

_____

Name of Installer, if known _____

Water to be supplied by: _____ Public Water _____ Drilled Well _____ Other(Indicate Source)

Distance to nearest public sanitary sewer _____

I (we) understand and am (are) in agreement with the proposed sewage disposal system installation as shown attached. If approved the Health Department inspection staff can expect that said disposal system, and the water supply and drainage facilities will be installed as indicated and without charges, unless a revised plan is submitted and approved by the Monroe County Department of Health.

SIGNED: _____ Owner

_____ Owner(s)

_____ Builder

_____ Developer

DO NOT WRITE BELOW THIS LINE

Inspection Type _____ Inspector _____ Date _____

RETURN TO:

MONROE COUNTY DEPARTMENT OF PUBLIC HEALTH
BUREAU OF PUBLIC HEALTH ENGINEERING – ROOM 938
PO BOX 92832 111 WESTFALL ROAD, ROCHESTER, NEW YORK 14692

HD-5835-10-3215

REFERRAL FORM

(To be filled out by Building Inspector or other responsible Town Official)

TO: Monroe County Department of Health
Bureau of Public Health Engineering - Room 938
PO BOX 92832 111 Westfall Road, Rochester, New York 14692

FROM: Town of _____

RE: RESIDENTIAL CONSTRUCTION USING PRIVATE SEWAGE DISPOSAL

The property indicated below is proposed for residential use and is referred to you for review and approval or disapproval of an individual sewage disposal system. This land is in an area which is zoned residential and the town has no objection to the construction of a house on this lot providing adequate water supply and sewage disposal can be provided.

LOCATION:

Street and Number _____

Description (distance from corner, frontage and depth, side of street (North, South, East or West) and any other features that will help inspection in locating the property)

_____

_____

_____

PERTINENT INFORMATION:

In my Opinion: (Indicate answer by Check or X)

	YES	NO	DON'T KNOW
The property is in a wetland			
The property is in a flood plain			
The property is part of a subdivision as defined in Article III of the Monroe County Sanitary Code			
Drainage is a problem			
Ground water is a problem			

The following additional information is provided for your consideration:

_____

_____

_____

NAME _____ TITLE _____

Department of **Public Health**
Monroe County, New York

Maggie Brooks
County Executive

Andrew S. Doniger, M.D., M.P.H.
Director

RAISED FILL SYSTEMS CONSTRUCTION & INSPECTION PROCEDURES

Construction Procedures:

1. Heavy construction equipment shall not be allowed within the area of the system. The original soil must be left in place and plowed with at least a double bottomed blade/plow and the furrow turned upslope. The soil must not be wet when plowed.

2. No standing water in the fill area is allowed.

3. Fill material must be placed on the edge of the prepared base and pushed into place by a bulldozer while maintaining at least six (6) inches of fill under the tracks.

4. The absorption trenches shall be constructed in the fill material. Trenches shall not be constructed if the frost has penetrated the fill more than three (3) inches.

5. The entire surface of the fill system, except the taper, shall be covered with a minimum of six (6) inches of topsoil mounded to enhance runoff from the system and seeded to grass. Tapers shall be covered with three (3) to six (6) inches of topsoil.

6. Swales shall be constructed to divert surface water around the system and provide drainage away from the system.

Inspection Procedures:

Please call the Monroe County Department of Public Health (MCDPH) at 753-5060 to schedule the following inspections **at least 24-hr** in advance:

1. Plow Inspection - The MCDPH will verify the plow is adequate and verify the location and orientation of the future sand bed. If requested, a sand sample will be tested.

2. Sand Bed Inspection - Before installation of the trenches, the MCDPH will verify sand bed dimensions and depth. A sand sample will be tested.

3. Complete Inspection - Before backfilling, the MCDPH will verify all system components are installed per the approved plan and MCDPH requirements.

4. Final Grade Inspection - The MCDPH will verify there is adequate cover over system components and surface drainage is adequate.

If you have any questions regarding these procedures, please contact this office at 753-5060.

MCDOH Property Transfer Inspection Recommendations:

For homes with individual sewage disposal systems and private well drinking water.

The following list contains recommendations **only** and is not intended to be all-inclusive. This list should be used as a reference. Your contractor may perform additional and/or alternative tests in the assessment of an existing sewage disposal system.

1. **Inspect Septic Tank(s)**

   Check the following:
   - A. The level of liquid in the tank(s).
   - B. Inlet and outlet baffles to make certain that they are intact and not plugged.
   - C. The physical condition of the tank.

NOTE: Steel tanks – Although steel tanks are not allowed for new construction, MCDOH does not require replacement with a concrete tank if the steel one is in acceptable condition and functioning properly.

2. **Inspect System Distribution Box**

   Check the following:
   - A. The level of liquid in the box.
   - B. The distribution of effluent occurs equally.
   - C. The physical condition of the box.

3. **Inspect the Internal Plumbing**

   Check the following:
   - A. Laundry waste is connected to the septic tank.
   - B. Sump discharges away from the septic system.
   - C. Plumbing fixtures drain properly (i.e. toilets flush).

4. **Check for Sewage Overflows and/or Discharges**

   - A. Actual overflow or evidence of previous overflow.
   - B. "Cheater" pipe which discharges to a stream or roadside ditch.

5. **Is the house currently occupied?**

   - A. The system's operating condition cannot be determined if the house has been unoccupied.
   - B. The number of current residents or daily average sewage flow.

6. **Is there a current complaint on file with MCDOH?**

7. **Sample well water for coliform bacterial, lead, and nitrates.**

8. **Check existing water system components to ensure proper working conditions.**